

October 24, 2006

Idaho Department of Environmental Quality  
Air Pollution Control Division  
1410 N. Hilton  
Boise, ID 83706

Subject: Pacific Ethanol Burley, LLC  
Burley, Idaho

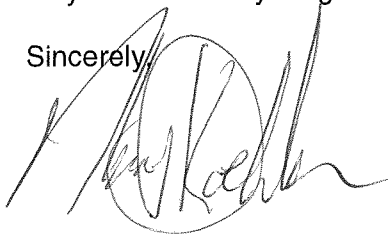
Dear Bill Rodgers;

Enclosed, please find the application for the Authority to Construct Permit for a new ethanol production facility (Pacific Ethanol Burley, LLC) to be located near Burley, Idaho. Pacific Ethanol Burley, LLC will be a 50 million gallon per year (undenatured ethanol) facility with a production limit of 60 million gallons per year using the latest in environmental controls. Pacific Ethanol Burley, LLC will be a synthetic minor source of air emissions.

The modeling report will be provided as a separate submittal.

If you have any questions or comments, please feel free to contact me at (503) 235-8251 or you may contact Cheryl Pagard of Natural Resource Group, Inc. at (720) 956-5312.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tom Koehler', written over a circular stamp or seal.

*Vice* Tom Koehler  
President  
Pacific Ethanol Inc.  
Pacific Ethanol Burley, LLC

# Application for the Authority to Construct

Pacific Ethanol Burley, LLC

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Department of Environmental Quality  
State Air Program

**November 2006**

*Project No. PAC 2006-105*



Pacific Ethanol, Inc.



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## **EXECUTIVE SUMMARY**

Pacific Ethanol Inc. proposes to build a new fuel-grade ethanol production plant, Pacific Ethanol Burley, LLC, in Burley, Idaho. Pacific Ethanol Burley, LLC (Burley) will be a corn dry mill plant designed for 50 million gallons a year (MMGal/yr) of undenatured ethanol production.

Emission sources at Burley will include grain handling and processing, fermentation, distillation, fuel combustion, liquid storage tanks, and equipment and operation fugitives. The facility has a proposed maximum permitted capacity of 60 million gallons of undenatured ethanol, or 63 million gallons of denatured ethanol, on an annual basis.

Burley will have a controlled potential to emit (PTE) below 100 tons per year (tpy) for particulate matter (PM), particulate matter with less than ten microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), oxides of nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC), and carbon monoxide (CO). The facility will be a synthetic minor with respect to both Title V permitting and New Source Review.

Liquid storage tanks TK02, TK05 and TK06 are the only tanks subject to the Federal New Source Performance Standards (NSPS) Subpart Kb for storage tanks. However, all six storage tanks will be equipped with internal floating roofs in order to comply with Subpart Kb. The boilers will comply with NSPS Subpart Dc for natural gas and propane firing. The facility will employ a leak detection program for applicable components handling over 10% VOC by weight to comply with Subpart VV.

Burley will provide approximately 40 industrial full-time jobs to the area near Burley, Idaho. The plant will provide value-added support for the regional corn price. The fuel grade ethanol will provide domestic sources supplementing and extending petroleum based gasoline supplies and the wet cake will provide an alternative source to other animal feeds.

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## **1.0 INTRODUCTION**

Pacific Ethanol, Inc. is proposing to build a new fuel-grade ethanol facility with a maximum permitted capacity of 60 MMGal/yr of undenatured ethanol. The facility will be located near Burley, in Cassia County, Idaho. The facility will process approximately 22.5 million bushels of corn per year.

### **1.1 Project Description**

The basis for the production of ethanol is to convert cornstarch to sugars and then convert the sugars to ethanol (i.e. grain alcohol).

#### Grain Handling and Milling Operations

The grain handling operations consist of unloading of corn by trucks or railcars at a maximum rate of 420 tons per hour (tph), two 262,700-bushel capacity storage bins, two corn elevators, and associated conveyors. Corn is received at the plant in 25-ton hopper bottom trucks or railcars at two dump pits (one each for trucks and railcar) that are located inside an enclosed building. The dump pits are fitted with conveyor belts, which feed the elevator leg and grain-to-grain storage bins. The dump pits and associated corn transfer points are controlled by the corn receiving and handling baghouses (SV01, SV02). Corn exits the corn storage bins through a surge bin prior to the start of hammermilling operations. Both storage bins are equipped with ten vent spot filters equally spaced along the outer roof edge, which act as baghouses (SV03, SV04,). The annual corn unloading rate estimated based on the maximum anhydrous ethanol production rate of 60 MMGal/yr is 629,213 tons per year (tpy).

The corn milling operations consist of a grain surge bin, a scalper (screening bin) and three hammermills. Corn is fed by the reclaim system from the corn storage silos, which moves it from the adjacent surge bins to the scalper at a maximum rate of 79 tph and 629,213 tpy. The surge bin has a maximum capacity of 1,200 bushels. The scalper removes sticks, cobs, and other debris from the corn. Particulate matter (PM/PM<sub>10</sub>) emissions from the scalper and surge bins are controlled by the four surge bin spot vent filters (SV05), which are equally spaced along the outer roof edge. The hammermills grind the scalped corn to the required particle size. All three hammermills are controlled by a baghouse (SV06). The solids collected in all of the baghouses are returned to the process downstream of the hammermills. The emissions are estimated based on a baghouse outlet grain loading of 0.005 gr/dscf, a vent filter outlet grain loading of 0.01 gr/dscf (based on vendor guarantee) and design air flow rates.

The proposed corn receiving area is partially enclosed and the dump pits are aspirated to a fabric filter dust collector (baghouse), the grain unloading dust collection system is assumed to have 90% capture efficiency. The remaining 10% of grain handling emissions are identified as and quantified for as fugitive dust emissions (FS02).

### Fermentation and Distillation Operations

The fermentation and distillation operations consist of a slurry tank, yeast tank, liquefaction tank, beerwell, de-gas vessel, three-column distillation unit, molecular sieve, 200 proof condenser, whole stillage tank, process condensate tank, thin stillage tank, syrup tank, evaporators, two centrifuges, and four fermenters.

#### Pre-Fermentation:

Milled grain is transferred from the hammermills to the slurry tank. The grain is mixed with process water from the process condensate tank and hot water from the hot well in the slurry tank. The slurry is then cooked, liquefacted with a small amount of the liquefying enzymes, and the resultant mash is cooled. The slurry tank provides surge capacity in the cooking system, allows for pre-liquefaction of the starch, and if necessary, controls viscosity. In addition, caustic or anhydrous ammonia is added for pH control, as required. Mash leaves the slurry tank and is cooled by flashing in a liquefaction tank. The flash vapor is recovered as a source of energy for stillage evaporation. The remaining liquefying enzyme is then added to the mash in the liquefaction tank to begin the hydrolysis of the previously gelatinized starch. After liquefaction, previously hydrated and actively growing yeast is added. Backset (thin stillage recycle) or sulfuric acid may be added to the mash to lower the pH. A mash cooler pump pumps the mash from the base of the liquefaction tank through a set of heat exchangers called "mash coolers". Cooling tower water provides for primary cooling to ultimately reduce the mash temperature to about 90 °F.

#### Fermentation:

The cooled mash will be mixed with yeast and more enzymes in one of four 560,200-gallon fermenters. Saccharifying enzymes, nutrients, and industrial antibiotics are added to the fermenter during filling. The fermenter contents are recirculated by fermenter pumps, through the fermenter coolers, to remove heat generated by fermentation. The carbon dioxide (CO<sub>2</sub>) generated during fermentation is vented to the fermentation scrubber for recovery of ethanol vapors. After approximately 48 hours of fermentation the resultant liquid (beer) will contain 11%-15% ethanol by weight. When

fermentation is completed, the beer is transferred to the 729,400-gallon beerwell via the fermenter pumps. Cleaning and sterilizing the fermenters, fermenter coolers, mash coolers, and related process piping is accomplished by an automated clean-in-place (CIP) system. Volatile organic compound (VOC) emissions are controlled by a packed bed fermentation wet gas scrubber and then vented to a regenerative thermal oxidizer (RTO) to destruct the remaining VOC.

#### Distillation, Dehydration, Centrifugation and Evaporation:

The beerwell serves as a surge tank connecting the simultaneous saccharification and fermentation system with distillation. The contents of the beerwell are kept circulated by the beerwell agitator. The beer, which consists of approximately 11% -15% ethanol, is pumped by the distillation beer feed pump through the beer preheat train to the beer stripper. The beer stripper's function is to separate the ethanol from the residual grain solids. The remaining grain solids, known as stillage, are sent to the whole stillage tank to be further processed for use as cattle feed. Hot vapor from the beer stills is used to pre-heat the beer in the beer preheat train. Sulfuric acid may be added between the fermentation and distillation processes for pH adjustment.

The beer will distill in a three-column distillation process consisting of a beer stripper, side stripper and rectifier column; the resultant product is 95% ethanol and 5% water (190-proof) and whole stillage consisting of solids and water. Hydrous ethanol vapor from distillation is drawn and superheated in the molecular sieve using steam. The superheated ethanol vapor flows to the molecular sieve units in a process known as dehydration. The dehydration process is used to increase the ethanol concentration from 92% to 99.3%. The vapor passes up through one bed of molecular sieve beads, which is under pressure control. Incoming water is adsorbed on the molecular sieve material. The molecular sieve units are cycled so that one is regenerating under vacuum while the other is adsorbing water under pressure from the hydrous ethanol vapor stream. The regenerating stream is sent back to distillation for processing. The molecular sieve removes remaining 5% water from the product resulting in 100% ethanol (200-proof). The anhydrous ethanol product flows through the molecular sieve cooler to the two product shift tanks. The product will then be combined with 5% natural gasoline and sold as near 200-proof denatured ethanol. The denatured ethanol will be shipped via tanker truck and rail car.

Stillage from the whole stillage tank is pumped to the process condensate tank, where excess process water and water vapor is removed, condensed, and sent to the liquefaction tank. The remaining stillage is sent to the evaporators, where the feed is

split into two flows: the evaporated syrup (consisting of water and sugars) is sent to the syrup tank, the remaining stillage is sent to the stillage centrifuges. The centrifuged product consists of the collected solids, or wet cake, and the centrate. The wet cake, also called wet distillers grain with solubles (WDGS), consists of approximately 33-35% solids (mostly suspended solids) and 65-67% water. The centrifuge is positioned to discharge the cake onto a conveyor that transfers the wet cake to the wet cake storage. The centrate, called thin stillage, consists of approximately 8.0% total solids. The majority of these solids are dissolved solids. The thin stillage is stored in the thin stillage tank located adjacent to the centrifuge units. A thin stillage tank pump recirculates the contents in the centrate surge tank to ensure a well-mixed solution. Centrate is pumped from the thin stillage tank back to the evaporators. The multiple-effect evaporator system removes water from the thin stillage on a continuous, steady-state basis, concentrating the total solids fraction from 8% to approximately 34% solids in the concentrated dissolved solids syrup (CDS). The evaporator system's vacuum pumps discharge into the vent gas scrubber through the CO<sub>2</sub> collection system. The evaporator condensate is recycled back to the process as dilution water for the mashing process and CIP rinses. CDS is added to the wet cake prior to storage. The non-condensables from the distillation process, as well as emissions from the dehydration, centrifugation and evaporation process, are vented to a packed bed vent gas wet scrubber for control of the VOC emissions and then vented to a regenerative thermal oxidizer (RTO) to destruct the remaining VOC.

#### Wet Distiller's Grain w/Solubles (WDGS)

The wet cake may be stored in an open storage area, from which it may be loaded onto trucks for delivery to cattle feed lots in the area. At about 65% water content, the wet cake will remain moist on the storage pad. Because the wet cake will be transferred offsite quickly (e.g., in 1 or 2 days), the cake will not dry completely in any type of extreme weather. Therefore, wet cake storage and handling is expected to produce negligible PM<sub>10</sub> emissions and is listed as a fugitive source (FS03).

#### Boilers

Steam is required to power the process. The facility will use three natural gas fired boilers with a maximum capacity of 75.6 MM Btu/hr each (SV09, SV10, SV11).

### Ethanol Loadout Operations

Liquid product loading consists of submerged loading of denatured fuel ethanol into tanker trucks and tanker railcars. The emissions from the truck loadout will be controlled by the RTO.

### Fugitive VOC Emissions

Fugitive VOC emissions will occur from leaks in plant piping, such as flanges, pumps, and valves (FS04). These estimates for equipment leaks are based on the United States Environmental Protection Agency (USEPA) emission factors. A credit for the leak detection and repair program required per New Source Performance Standards (NSPS) Subpart VV has been applied. The component count used in the calculations is based on a component count at a similar facility.

### Cooling Towers

Burley will use a cooling tower that is used to cool non-contact process water back to a temperature that is useful for the process. The cooling tower is listed as a fugitive emission (FS05)

PM/PM<sub>10</sub> emissions at the cooling tower were calculated with a mass balance approach using data on water circulation rate, total dissolved solids (TDS) concentration, and cooling tower drift losses. This method assumes that the TDS present in water evaporated at the cooling tower produce PM/PM<sub>10</sub> emissions.

### Storage Tanks

The finished ethanol product is blended with a denaturant prior to storage and loadout. 190 proof ethanol will be stored in one (1) 39,000 gallon tank (TK01) prior to entering the molecular sieves. Denaturant used to blend with the ethanol product will be stored in one (1) 74,300 gallon denaturant tank (TK02). Two (2) 116,800 gallon anhydrous ethanol tanks (TK03, TK04) will be used to store finished ethanol prior to blending and shipment. Denatured ethanol will be stored in two 350,000 gallon tanks (TK05, TK06).

All tanks will utilize an internal floating roof for VOC and HAP emission control.



### Plant Roads

The facility in-plant haul roads will be paved. Fugitive dust emissions from traffic on these roads have been calculated using AP-42 emission factors and typical characteristics for paved roads. A silt load factor that is typical of paved roads at 0.6 g/m<sup>2</sup> has been used in the haul road calculations. The emission unit ID for plant roads is listed as a fugitive source (FS01).

A process flow diagram is included in Appendix B and the facility site plan is included in Appendix C.

## 2.0 REGULATORY APPLICABILITY

A review of federal, state and local air quality regulations is provided in Table 2-1. Each regulation is described in the following sections.

**Table 2-1. Regulatory Applicability Summary**

Program Description		Regulatory Citation	Applicable
2.1	National Ambient Air Quality Standards (NAAQS)- (dispersion modeling)	40 CFR Part 50	NO
2.2	Title V Operating Permit	40 CFR Part 70	NO
2.3	Air Pollutants (NESHAPs)	40 CFR Parts 61, 63	NO
2.4	New Source Review (NSR)	40 CFR Part 52	NO
2.5	New Source Performance Standards (NSPS)	40 CFR Part 60 Subpart VV, Dc, and Kb	YES
		Subpart DD, Db, NNN, and RRR	NO
2.6	Acid Rain Requirements	40 CFR Parts 72-78	NO
2.7	Stratospheric Ozone Protection Requirements	40 CFR Part 82	NO
2.8	Risk Management Programs For Chemical Accidental Release Prevention	40 CFR Part 68	YES
2.9	State Rules		
	Fuel Burning Equipment	IDAPA 58.01.01.676	YES
	Particulate Matter	IDAPA 58.01.01.703	YES
	Fugitive Dust Control	IDAPA 58.01.01.808	YES

### 2.1 National Ambient Air Quality Standards (NAAQS)

Primary National Ambient Air Quality Standards (NAAQS) are identified in 40 CFR Part 50 and define levels of air quality, which the United States Environmental Protection Agency (USEPA) deems necessary to protect the public health. Secondary NAAQS define levels of air quality, which the USEPA judges necessary to protect public welfare from any known, or anticipated, adverse effects of a pollutant. Examples of public welfare include protecting wildlife, buildings, national monuments, vegetation, visibility, and property values from degradation due to excessive emissions of criteria pollutants.

Specific standards for the following pollutants have been promulgated by USEPA: PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, ozone, and lead. Burley plant will emit PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and VOCs, a precursor to ozone. The facility is a minor source with respect to PSD and Title V as it will not exceed any major source thresholds.

### 2.2 Title V (Part 70) Operating Permit

Title V of the Clean Air Act (CAA) created the federal operating permit program. These permitting requirements are codified in 40 CFR Part 70. The operating permits required

under these rules are often referred to as "Part 70 operating permits." These permits are required for major sources with a PTE (considering federally enforceable limitations) greater than 100 tpy for any criteria pollutant, 25 tpy for all hazardous air pollutants (HAPs) in aggregate, or 10 tpy of any single HAP. Burley will qualify as a synthetic minor source and will be exempt from a Title V operating permit.

### **2.3 National Emission Standards for Hazardous Air Pollutants (NESHAPs)**

Two sets of National Emissions Standards for Hazardous Air Pollutants (NESHAPs) may potentially apply to the Burley facility. The first NESHAP regulations were developed under the auspices of the original CAA. These standards are codified in 40 CFR Part 61, and address a limited number of pollutants and industries. 40 CFR Part 61 regulations do not apply to this planned facility.

Newer regulations are codified in 40 CFR Part 63 under the authority of the 1990 Clean Air Act Amendments (CAAA). These standards regulate HAP emissions from specific source categories and typically affect only major sources of HAPs. Part 63 regulations are frequently called Maximum Achievable Control Technology (MACT) standards. Major HAP sources have the PTE 10 tpy or more of any single HAP or 25 tpy or more of all combined HAP emissions. At the Burley facility, potential emissions of individual HAPs will be less than 10 tpy and combined HAP emissions will be less than 25 tpy. Therefore, the facility is not subject to 40 CFR Part 63.

### **2.4 New Source Review (NSR) Requirements**

Cassia County is designated as an attainment area for all criteria pollutants. Therefore, the prevention of significant deterioration (PSD) regulations codified in 40 CFR Part 52 could potentially apply to the proposed facility. The PSD rule applies to: (1) a new major source that has the potential to emit 100 tons per year or more for any criteria pollutant for a facility that is one of the 28 industrial source categories listed in 40 CFR § 52.21(b)(1)(i)(a); or (2) a new major source that has the potential to emit 250 tons per year or more if the facility is not on the list of industrial source categories; or (3) a modification to an existing major source that results in a net emission increase greater than a PSD significant emission rate as specified in 40 CFR § 52.21 (b)(23)(i); or (4) a modification to an existing minor source that is major in itself.

Chemical processing plants are among the 28 industrial source categories listed in the PSD rule. However, the facility's PTE does not exceed the major source threshold for any criteria pollutants. Therefore, Burley is not subject to PSD regulations.

## 2.5 New Source Performance Standards (NSPS)

New Source Performance Standards (NSPS) in 40 CFR Part 60 are applicable to new, modified, or reconstructed stationary sources that meet or exceed specified applicability thresholds. The facility's storage tanks are subject to NSPS Subpart Kb for organic liquid storage tanks. The facility boilers are also subject to NSPS Subpart Dc and will comply by burning natural gas only. In addition, the facility is subject to NSPS subpart VV, which establishes standards for VOC equipment leaks from synthetic organic chemicals manufacturing facilities. The facility will install and operate a leak detection program in accordance with Subpart VV. These sources will comply with the NSPS regulations.

### 2.5.1 Standards of Performance for Organic Liquid Storage Tanks

The NSPS Subpart Kb, "Standards of Performance of Organic Liquid Storage Tanks" is applicable to the facility. The standard is applicable to volatile organic liquid storage vessels for which construction, reconstruction, or modification commenced after July 23, 1984, are those in 40 CFR Part 60.110b to 60.117b, inclusive. The requirements of Subpart Kb may apply in part or in full depending on the size of the tank and vapor pressure of its contents. The full requirements of Subpart Kb apply if the tank is greater than 75 cubic meters ( $m^3$ ) but less than 151  $m^3$  and the contents have a maximum true vapor pressure of more than 15.0 kilopascals (kPa) or if the tank is greater than 151  $m^3$  and the maximum true vapor pressure is greater than 3.5 kPa. If the tank does not meet these vapor pressure requirements, the tank may still be subject to Subpart Kb if the tank is greater than 75  $m^3$ . Table 2.5-1 summarizes the storage tank NSPS applicability.

**Table 2.5-1. Storage Tank NSPS Applicability**

Tank ID #	Contents	Capacity gallons ( $m^3$ )	Vapor Pressure <sup>A</sup> (kPa)	Roof Type	NSPS Kb Applicability
TK01	190 Proof Ethanol	116,800 (442.0)	2.99	Float	No
TK02	Denaturant	74, 300 (281.2)	28.29	Float	Yes, full
TK03	200 Proof Ethanol	116,800 (442.0)	2.99	Float	No
TK04	200 Proof Ethanol	116,800 (442.0)	2.99	Float	No
TK05	Denatured Ethanol	500,000 (1892.7)	3.64	Float	Yes, full
TK06	Denatured Ethanol	500,000 (1892.7)	3.64	Float	Yes, full

<sup>A</sup> The maximum true vapor pressure is defined in 40 CFR 60.111b as the partial pressure exerted by the stored volatile organic liquid (VOL) at the temperature equal to the highest calendar-month average of the VOL storage temperature for VOLs stored above or below the ambient temperature or at the local maximum monthly temperature as reported by the National Weather Service for VOLs stored at ambient temperature. The vapor pressures identified in the table are based on the maximum monthly storage temperature obtained from the EPA TANKS 4.0 program.

Based on interpretation of the definition, these vapor pressures may be slightly lower than the maximum true vapor pressure necessary for the applicability of Subpart Kb.

As shown in Table 2.5-1, the full requirements of Subpart Kb will apply only to storage tank TK02, TK05 and TK06; however, all six tanks will be constructed in accordance Subpart Kb, including the use of internal floating roofs to reduce VOC emissions from the tanks.

### **2.5.2 Standards of Performance Steam Generating Units**

Subpart Dc of the NSPS, "Standards of Performance for Small Industrial, Commercial, and Institutional Steam Generating Units" applies to the boilers at the facility because the total heat input to each boiler is between 10 and 100 million British thermal units per hour (MMBtu/hr). The boilers are not subject to any emission limitations in Subpart Dc because they will burn natural gas only. The boilers will, however, be subject to the monitoring and recordkeeping requirements identified in NSPS Subpart Dc.

### **2.5.3 Standards of Performance for Equipment Leaks**

Subpart VV of the NSPS, "Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry" applies to the facility. The standard applies to affected facilities in the synthetic organic chemicals manufacturing industry (40 CFR §§60.480 to 60.489). The facility will implement a leak detection and repair program in accordance with Subpart VV.

## **2.6 Acid Rain Requirements**

The acid rain requirements codified in 40 CFR Parts 72-78 apply only to utilities and other facilities that combust fossil fuel (mainly coal) and generate electricity for wholesale or retail sale. The proposed facility will not produce electrical power for sale. Therefore, the facility is not subject to the acid rain provisions and will not require an acid rain permit.

## **2.7 Stratospheric Ozone Protection Requirements**

Protection of the stratospheric ozone layer was promulgated as part of the CAAA. Sections 601-618 limit activities that deplete stratospheric ozone. The stratospheric ozone protection requirements may apply to this facility. Use of some fire equipment could potentially release an ozone depleting substance known as halons. Release of halons during equipment maintenance is unlawful. If the fire protection equipment is subject to stratospheric ozone protection program requirements in 40 CFR Part 82, a

third-party contractor will be hired by Burley to maintain the fire protection equipment in accordance with the stratospheric ozone protection requirements.

## **2.8 Risk Management Programs for Chemical Accidental Release Prevention**

The facility is subject to the Chemical Accidental Release Prevention Program and will develop and implement a Risk Management Plan (RMP). Facilities that produce, process, store, or use any regulated toxic or flammable substance in excess of the thresholds listed in 40 CFR Part 68 must develop a RMP. The facility will use a denaturant called natural gasoline, which contains 30-40% pentane, an RMP chemical. Storage will exceed the applicability thresholds. The facility will also store ammonia and sulfuric acid in quantities greater than 10,000 pounds. An RMP will be prepared and submitted, as required by 40 CFR 68.

## **2.9 State Rules**

The Idaho Administrative Procedure Act (IDAPA) promulgates several emissions regulations that apply to Burley in addition to those listed above.

### **2.9.1 Fuel Burning Equipment – Particulate Matter**

IDAPA 58.01.01.676 restricts any fuel burning source of 10 MMBtus or greater to limit the PM released from combustion to 0.015 grains per dry standard cubic feet. The boilers at Burly will comply by burning natural gas only.

### **2.9.2 Particulate Matter**

IDAPA 58.01.01.703 promulgates restrictions on PM for the entire facility based on process weight. Burley will comply with this rule by using baghouse filters and dust control practices to limit the facility's emission.

### **2.9.3 Fugitive Dust Control**

IDAPA 58.01.01.808 promulgates the implementation of a fugitive dust control system for any plant that releases fugitive particulate matter. Burley will comply by paving all facility roads and implementing a dust suppression plan.

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### 3.0 EMISSION SUMMARY

A summary of the potential emissions for the facility is presented in Table 3-1. Emission calculations have been completed for: PM, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOCs, CO, and both individual and combined hazardous air pollutants. Detailed emission calculations are included in Appendix C. The TANKS 4.09 data used to estimate the VOC emissions from the storage tanks is provided in Appendix D. Permit application forms are included as Appendix E.

**Table 3-1. Pacific Ethanol Burley PTE**

<b>PM (tpy)</b>	<b>PM<sub>10</sub> (tpy)</b>	<b>PM<sub>2.5</sub> (tpy)</b>	<b>SO<sub>2</sub> (tpy)</b>	<b>NO<sub>x</sub> (tpy)</b>	<b>VOC (tpy)</b>	<b>CO (tpy)</b>	<b>Individual HAP (tpy)</b>	<b>Combined HAP (tpy)</b>
33.94	17.23	14.84	0.60	50.98	22.47	33.69	5.56	8.50



APPENDIX A  
EMISSION CALCULATIONS

**Pacific Ethanol Burley, LLC**  
**Limited Potential Emissions @ 60 million gallons ethanol production**

Stack/ Vent ID	Control Equipment ID	Emission Unit ID	Emission Sources Associated with Ethanol Operations	Criteria Pollutants (Limited Emissions)						
				PM (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)	SO <sub>2</sub> (tpy)	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)
SV01	CE03	EU01	Truck Dump Pit	SV01	SV01	SV01	---	---	---	---
SV01	CE03	EU02	Rail Dump Pit	SV01	SV01	SV01	---	---	---	---
SV01	CE03	SV01	Corn Receiving Baghouse	3.75	3.75	3.75	---	---	---	---
SV02	CE02	EU03	Corn Conveyor #1	SV02	SV02	SV02	---	---	---	---
SV02	CE02	EU04	Corn Elevator #1	SV02	SV02	SV02	---	---	---	---
SV02	CE02	EU05	Corn Conveyor #2	SV02	SV02	SV02	---	---	---	---
SV02	CE02	EU06	Corn Elevator #2	SV02	SV02	SV02	---	---	---	---
SV02	CE02	EU07	Scalper	SV02	SV02	SV02	---	---	---	---
SV02	CE02	EU08	Corn Conveyor #3	SV02	SV02	SV02	---	---	---	---
SV02	CE02	SV02	Corn Handling Baghouse	1.88	1.88	1.88	---	---	---	---
SV03	CE03	EU09	Corn Bin #1	SV03	SV03	SV03	---	---	---	---
SV03	CE03	SV03	Corn Bin #1 Spot Filters	0.15	0.15	0.15	---	---	---	---
SV04	CE04	EU10	Corn Bin #2	SV04	SV04	SV04	---	---	---	---
SV04	CE04	SV04	Corn Bin #2 Spot Filters	0.15	0.15	0.15	---	---	---	---
SV05	CE05	EU11	Surge Bin	SV05	SV05	SV05	---	---	---	---
SV05	CE05	SV05	Surge Bin Spot Filters	0.08	0.08	0.08	---	---	---	---
SV06	CE06	EU12	Hammermill #1	SV06	SV06	SV06	---	---	---	---
SV06	CE06	EU13	Hammermill #2	SV06	SV06	SV06	---	---	---	---
SV06	CE06	EU14	Hammermill #3	SV06	SV06	SV06	---	---	---	---
SV06	CE06	SV06	Hammermilling Baghouse	1.69	1.69	1.69	---	---	---	---
SV12	CE07, CE09	EU16	Liquefaction Tank	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU17	Yeast Tank	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU18	Fermenter #1	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU19	Fermenter #2	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU20	Fermenter #3	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU21	Fermenter #4	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU22	Beerwell	---	---	---	---	---	SV12	---
SV12	CE07, CE09	EU23	De-gas Vessel	---	---	---	---	---	SV12	---
SV12	CE07	SV12	Fermentation Scrubber	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU15	Slurry Tank	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU24	Beer Stripper	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU25	Side Stripper	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU26	Rectifier Column	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU27	Molecular Sieve	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU28	200 Proof Condenser	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU29	Whole Stillage Tank	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU30	Process Condensate Tank	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU31	Evaporator	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU32	Centrifuge #1	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU33	Centrifuge #2	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU34	Syrup Tank	---	---	---	---	---	SV12	---
SV12	CE08, CE09	EU35	Thin Stillage Tank	---	---	---	---	---	SV12	---
SV12	CE08	SV12	Vent Gas Scrubber	---	---	---	---	---	SV12	---
SV12	CE09	EU39	Ethanol Truck Loadout*	---	---	---	---	---	SV12	---
SV12	CE09	EU40	Ethanol Rail Loadout	---	---	---	---	---	SV12	---
SV12	CE09	SV12	Regenerative Thermal Oxidizer**	0.20	0.20	0.20	0.02	1.31	9.85	2.25
SV09	---	EU36	Boiler #1	2.47	2.47	2.47	0.19	16.56	1.78	10.48
SV10	---	EU37	Boiler #2	2.47	2.47	2.47	0.19	16.56	1.78	10.48
SV11	---	EU38	Boiler #3	2.47	2.47	2.47	0.19	16.56	1.78	10.48
---	---	TK01	190 Proof Tank	---	---	---	---	---	0.05	---
---	---	TK02	Denaturant Tank	---	---	---	---	---	0.79	---
---	---	TK03	200 Proof Storage Tank	---	---	---	---	---	0.19	---
---	---	TK04	200 Proof Storage Tank	---	---	---	---	---	0.19	---
---	---	TK05	Denatured Ethanol	---	---	---	---	---	0.17	---
---	---	TK06	Denatured Ethanol	---	---	---	---	---	0.17	---
---	---	FS01	Truck Traffic	14.55	2.84	0.45	---	---	---	---
---	---	FS02	Fugitive Emissions from Grain Handling	6.44	1.43	1.43	---	---	---	---
---	---	FS03	Fugitive Emissions from Wet Cake Storage Pile / Loadout	---	---	---	---	---	2.67	---
---	---	FS04	Equipment Leaks	---	---	---	---	---	3.02	---
---	---	FS05	Cooling Towers	3.29	3.29	3.29	---	---	---	---
TOTAL				33.94	17.23	14.84	0.60	50.98	22.47	33.69

\* Ethanol Loadout is assumed to be 100% truck loadout for most conservative value.

\*\*The RTO controls emissions from the fermentation and distillations scrubbers, as well as ethanol loadout.

**Pacific Ethanol Burley, LLC**  
**Hazardous Air Pollutant Summary**

Pollutant	Boiler #1 (tpy)	Boiler #2 (tpy)	Boiler #3 (tpy)	RTO* (tpy)	Tanks (tpy)	Wetstack (tpy)	Total (tpy)
2-Methylnaphthalene	7.79E-06	7.79E-06	7.79E-06	6.18E-07	---	---	2.40E-05
3-Methylchloranthrene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
7,12-Dimethylbenz(a)anthracene	5.19E-06	5.19E-06	5.19E-06	4.12E-07	---	---	1.60E-05
Acenaphthene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Acenaphthylene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Acetaldehyde	---	---	---	5.53E+00	---	2.56E-02	5.56E+00
Acrolein	---	---	---	3.17E-02	---	4.22E-03	3.59E-02
Anthracene	7.79E-07	7.79E-07	7.79E-07	6.18E-08	---	---	2.40E-06
Arsenic	6.49E-05	6.49E-05	6.49E-05	5.15E-06	---	---	2.00E-04
Benzo(a)anthracene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Benzone	6.82E-04	6.82E-04	6.82E-04	5.26E-02	2.02E-02	---	7.49E-02
Benzo(a)pyrene	3.90E-07	3.90E-07	3.90E-07	3.09E-08	---	---	1.20E-06
Benzo(b)fluoranthene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Benzo(g,h,i)perylene	3.90E-07	3.90E-07	3.90E-07	3.09E-08	---	---	1.20E-06
Benzo(k)fluoranthene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Beryllium	3.90E-06	3.90E-06	3.90E-06	3.09E-07	---	---	1.20E-05
Cadmium	3.57E-04	3.57E-04	3.57E-04	2.83E-05	---	---	1.10E-03
Carbon Disulfide	---	---	---	1.05E-04	4.05E-04	---	5.10E-04
Chromium	4.54E-04	4.54E-04	4.54E-04	3.61E-05	---	---	1.40E-03
Chrysene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Cobalt	2.73E-05	2.73E-05	2.73E-05	2.16E-06	---	---	8.40E-05
Cumene	---	---	---	2.10E-04	8.09E-05	---	2.91E-04
Dibenzo(a,h)anthracene	3.90E-07	3.90E-07	3.90E-07	3.09E-08	---	---	1.20E-06
Dichlorobenzene	3.90E-04	3.90E-04	3.90E-04	3.09E-05	---	---	1.20E-03
Ethyl benzene	---	---	---	3.15E-02	1.21E-02	---	4.37E-02
Fluoranthene	9.74E-07	9.74E-07	9.74E-07	7.73E-08	---	---	3.00E-06
Fluorene	9.09E-07	9.09E-07	9.09E-07	7.21E-08	---	---	2.80E-06
Formaldehyde	2.43E-02	2.43E-02	2.43E-02	5.73E-03	---	5.12E-02	1.30E-01
Formic Acid	---	---	---	3.26E-02	---	---	3.26E-02
Hexane	5.84E-01	5.84E-01	5.84E-01	7.79E-02	1.21E-02	---	1.84E+00
Indeno(1,2,3-cd)pyrene	5.84E-07	5.84E-07	5.84E-07	4.64E-08	---	---	1.80E-06
Manganese	1.23E-04	1.23E-04	1.23E-04	9.79E-06	---	---	3.80E-04
Mercury	8.44E-05	8.44E-05	8.44E-05	6.70E-06	---	---	2.60E-04
Methanol	---	---	---	1.21E-01	---	3.20E-02	1.53E-01
Naphthalene	1.98E-04	1.98E-04	1.98E-04	1.57E-05	---	---	6.10E-04
Nickel	6.82E-04	6.82E-04	6.82E-04	5.41E-05	---	---	2.10E-03
Phenanthrene	5.52E-06	5.52E-06	5.52E-06	4.38E-07	---	---	1.70E-05
Pyrene	1.62E-06	1.62E-06	1.62E-06	1.29E-07	---	---	5.00E-06
Selenium	7.79E-06	7.79E-06	7.79E-06	6.18E-07	---	---	2.40E-05
Toluene	1.10E-03	1.10E-03	1.10E-03	1.05E-01	4.05E-02	---	1.49E-01
Xylenes	---	---	---	1.05E-01	4.86E-02	---	1.54E-01
<b>Total</b>	<b>0.61</b>	<b>0.61</b>	<b>0.61</b>	<b>6.10</b>	<b>0.13</b>	<b>0.11</b>	<b>8.18</b>

\*The RTO HAPs include dryer, fermentation, distillation and ethanol loadout HAPs.

**Pacific Ethanol Burley, LLC**  
**Grain Hammermilling Emission Calculations**

**Process Data**

Grain Required for 60.00 MMgal EtOH:

Grain Density:

Total Grain Receiving Throughput:

22.5 MM bushels/yr =

56 lb/bushel

629,213 tpy =

143656.05

71.8 ton/hr

Wet Cake:

Wet Cake Handling (32% solids):

140,289 lb/hr

70.1 ton/hr

140,289 lb/hr ÷ 2000 lb/ton =

**Emission Calculation Method**

Uncontrolled Potential Emissions = Flow Rate (DSCFM) · Emission Factor (gr/DSCF) ÷ 7,000 gr/lb · 60 min/hr

**PM<sub>10</sub>/PM<sub>2.5</sub> Emissions from Grain Receiving, Handling, and Hammermilling**

Stack ID	Emission Source	Flow Rate (DSCFM)	Emission Factor (gr/DSCF)	Controlled Emissions	
				(lb/hr)	(tpy)
SV01	Corn Receiving Baghouse	20,000	0.005	0.86	3.75
SV02	Corn Handling Baghouse	10,000	0.005	0.43	1.88
SV03	Corn Bin #1 Spot Filters	400	0.01	0.03	0.15
SV04	Corn Bin #2 Spot Filters	400	0.01	0.03	0.15
SV05	Surge Bin Spot Filters	200	0.01	0.02	0.08
SV06	Hammermilling Baghouse	9,000	0.005	0.39	1.69

**Emission Calculation Method**

Uncontrolled Potential Emissions = Throughput (ton/hr) · Emission Factor (lb/ton) · 8,760 hr/yr · 1 ton/2000 lb

**Fugitive PM Emissions from Grain Receiving, Handling, and Hammermilling**

Stack ID	Emission Source	Throughput (ton/hr)	AP-42* Emission Factor (lb/ton)	Uncontrolled PM Emissions		Capture Efficiency		Uncaptured PM Emissions	
				(lb/hr)	(tpy)			(lb/hr)	(tpy)
FS02	Fugitive Emissions from Grain Handling	420.0	0.035	14.70	64.39	10%	uncaptured	1.47	6.44

\*Emission factors taken from AP-42 Section 9.9.1, 6/98.

**Fugitive PM<sub>10</sub>/PM<sub>2.5</sub> Emissions from Grain Receiving, Handling, and Hammermilling**

Stack ID	Emission Source	Throughput (ton/hr)	AP-42* Emission Factor (lb/ton)	Uncontrolled PM <sub>10</sub> /PM <sub>2.5</sub> Emissions		Capture Efficiency		Uncaptured PM <sub>10</sub> /PM <sub>2.5</sub> Emissions	
				(lb/hr)	(tpy)			(lb/hr)	(tpy)
FS02	Fugitive Emissions from Grain Handling	420.0	0.0078	3.28	14.35	10%	uncaptured	0.33	1.43

\*Emission factors taken from AP-42 Section 9.9.1, 6/98.

**Pacific Ethanol Burley, LLC  
Fermentation (CO<sub>2</sub>) Scrubber**

Fermentation emissions will be routed to the RTO for additional control.

**Process Data**

Estimated Overall Scrubber and RTO Control Efficiency: 99%

**Proposed Potential VOC Emissions**

Ace Ethanol 2004 stack test data:  
Uncontrolled emission rate scaled as VOC =

$$= [0.0034 \text{ lb/hr (beerwell)} + 0.820 \text{ lb/hr (fermentation)}] \div 1.22 \text{ (propane to VOC ratio)}$$

85.77 lb/hr

Ace Ethanol production rate =

44.68 MMGal/yr

Outlet to the RTO =

115.18 lb/hr

VOC Controlled Emissions After RTO =

$$115.18 \text{ lb/hr} \cdot (1-0.99) =$$

1.15 lb/hr

Annual Controlled Potential Emissions =

$$1.15 \text{ lb/hr} \cdot 8760 \text{ hr/yr} \div 2000 \text{ lb/ton} =$$

5.04 tpy

Proposed VOC Limit\*:

\*Proposed limit includes a margin of safety.

$$1.50 \text{ lb/hr} = 6.56 \text{ tpy}$$

**HAP Emissions**

HAP Emissions are estimated based on emissions testing at Ace Ethanol in Stanley, WI on Sept. 14-16, 2004. Emissions are based on Method 18 test data for the 45 MMGal/yr plant and scaled linearly based on production capacity.

Pollutant	Uncontrolled Results (lb/hr)	Scaling Factor	Estimated Controlled Emissions (lb/hr)	Estimated Controlled Emissions (tpy)
Acetaldehyde*	32.5813	1.34	0.44	2.87E+00
Acrolein**	0.3479	1.34	4.672E-03	3.07E-02
Formaldehyde	0.0410	1.34	5.506E-04	3.62E-03
Formic Acid	0.3613	1.34	4.851E-03	3.19E-02
Methanol	1.3625	1.34	1.830E-02	1.20E-01
<b>Total</b>				<b>3.06</b>

\*Pollutant ton/yr emission contains a margin of safety.

\*\*Pollutant was not detected in the exhaust; therefore, 1/2 of the detection limit was used.

**Pacific Ethanol Burley, LLC**  
**Distillation (Vent Gas) Scrubber**

Distillation emissions will be routed to the RTO for additional control.

**Process Data**  
 Estimated Overall Scrubber and RTO Control Efficiency: 99.0%

**Proposed Potential VOC Emissions**

Ace Ethanol 2004 stack test data:  
 Uncontrolled emission rate scaled as VOC

$$= 0.12 \text{ lb/hr} \div 2.1 \text{ (propane to VOC ratio)} = 12.50 \text{ lb/hr}$$

$$40.79 \text{ MMGal/yr}$$

$$18.39 \text{ lb/hr}$$

$$0.18 \text{ lb/hr}$$

$$0.81 \text{ ton/yr}$$

Ace Ethanol production rate =

Outlet to the RTO =  $18.39 \text{ lb/hr} \cdot (1-0.99) =$

Controlled Potential Emissions After RTO =

Annual VOC emission rate =  $0.18 \text{ lb VOC/hr} \cdot 8760 \text{ hr/yr} \div 2000 \text{ lb/ton} =$

$0.24 \text{ lb/hr} = 1.05 \text{ tpy}$

**Proposed VOC Limit\*\*:**  
 \*Proposed limit includes a safety factor.

**HAP Emissions**

HAP Emissions are estimated based on emissions testing at Ace Ethanol in Stanley, WI on Sept. 14-16, 2004. Emissions are based on Method 18 test data for the 41 MMGal/yr plant and scaled linearly based on production capacity.

HAP	Uncontrolled Results (lb/hr)	Scaling Factor	Estimated Controlled Emissions (lb/hr)	Estimated Controlled Emissions (tpy)
Acetaldehyde*	27.50000	1.47	4.05E-01	2.66E+00
Acrolein**	0.10000	1.47	1.47E-03	9.66E-04
Formaldehyde	0.01875	1.47	2.76E-04	1.81E-04
Formic Acid	0.07125	1.47	1.05E-03	6.89E-04
Methanol	0.09875	1.47	1.45E-03	9.54E-04
<b>Total</b>				<b>2.66</b>

\*Pollutant ton/yr emission contains a margin of safety.  
 \*\*Pollutant was not detected in the exhaust; therefore, 1/2 of the detection limit was used.

**Pacific Ethanol Burley, LLC  
RTO Combustion Calculations**

**RTO**

Max Firing Capacity 6,000,000 BTU/hr  
Usable Firing Capacity: 6,000,000 BTU/hr

Primary Fuel Type: Natural Gas  
Heat Value: 1,020 BTU/cf  
Fuel Burning Capacity: 5,882 cf/hr

Pollutant	Emission Factor* (lb/MMBtu)	Emission Rate (lb/hr)	Max. Uncontrolled Emissions (tons/yr)
PM	0.00775	0.047	0.20
PM <sub>10</sub>	0.00775	0.047	0.20
Sox	0.00059	0.0035	0.02
NO <sub>x</sub> **	0.05000	0.300	1.31
VOC	0.00561	0.034	0.15
CO	0.08568	0.514	2.25

\*Emission Factors from Fifth Edition AP-42, Section 1.4, "Natural Gas Combustion", 10/96.

\*\*Emission Factor provided by manufacturer

**Pacific Ethanol Burley, LLC**  
**RTO HAP Calculations**

**HAP Emissions**

Pollutant	Emission Factor* (lb/MMBtu)	Potential Emissions	
		(lb/hr)	(tpy)
2-Methylnaphthalene	2.35E-08	1.4E-07	6.2E-07
3-Methylchloranthrene	1.76E-09	1.1E-08	4.6E-08
7,12-Dimethylbenz(a)anthracene	1.57E-08	9.4E-08	4.1E-07
Acenaphthene	1.76E-09	1.1E-08	4.6E-08
Acenaphthylene	1.76E-09	1.1E-08	4.6E-08
Anthracene	2.35E-09	1.4E-08	6.2E-08
Arsenic	1.96E-07	1.2E-06	5.2E-06
Benzo(a)anthracene	1.76E-09	1.1E-08	4.6E-08
Benzene	2.06E-06	1.2E-05	5.4E-05
Benzo(a)pyrene	1.18E-09	7.1E-09	3.1E-08
Benzo(b)fluoranthene	1.76E-09	1.1E-08	4.6E-08
Benzo(g,h,i)perylene	1.18E-09	7.1E-09	3.1E-08
Benzo(k)fluoranthene	1.76E-09	1.1E-08	4.6E-08
Beryllium	1.18E-08	7.1E-08	3.1E-07
Cadmium	1.08E-06	6.5E-06	2.8E-05
Chromium	1.37E-06	8.2E-06	3.6E-05
Chrysene	1.76E-09	1.1E-08	4.6E-08
Cobalt	8.24E-08	4.9E-07	2.2E-06
Dibenzo(a,h)anthracene	1.18E-09	7.1E-09	3.1E-08
Dichlorobenzene	1.18E-06	7.1E-06	3.1E-05
Fluoranthene	2.94E-09	1.8E-08	7.7E-08
Fluorene	2.75E-09	1.6E-08	7.2E-08
Formaldehyde	7.35E-05	4.4E-04	1.9E-03
Hexane	1.76E-03	1.1E-02	4.6E-02
Indeno(1,2,3-cd)pyrene	1.76E-09	1.1E-08	4.6E-08
Manganese	3.73E-07	2.2E-06	9.8E-06
Mercury	2.55E-07	1.5E-06	6.7E-06
Naphthalene	5.98E-07	3.6E-06	1.6E-05
Nickel	2.06E-06	1.2E-05	5.4E-05
Phenanathrene	1.67E-08	1.0E-07	4.4E-07
Pyrene	4.90E-09	2.9E-08	1.3E-07
Selenium	2.35E-08	1.4E-07	6.2E-07
Toluene	3.33E-06	2.0E-05	8.8E-05
<b>Total</b>			<b>0.05</b>

\*Emission Factor is from AP-42, 5th Edition, Section 1.4, "External Combustion Sources," 7/98



**Pacific Ethanol Burley, LLC**  
**Cooling Tower Emissions, FS05**

Cooling tower PM emissions are based on an induced draft cooling tower with a circulating water flow rate of 15,000 gallons per minute (gpm) and a conservative drift (0.005% of the circulating water flow). Calculations assume a total dissolved solids concentration of 2,000 ppm.

Circulating Flow Rate (gallons/minute)	Circulating Flow Rate (gallons/hour)	Total Drift (% circulating flow)	Total Drift (gal/hr)	Total Drift (lb/hr)	PM/PM <sub>10</sub> Emissions (lb/day)	PM/PM <sub>10</sub> /PM <sub>2.5</sub> Emissions (lb/yr)	PM/PM <sub>10</sub> /PM <sub>2.5</sub> Emissions (tpy)
15,000	900,000	0.005%	45.00	360.00	18.01	6,575	3.29

Density of Cooling Water = 8.34 lb/gal

TDS = 2,000 ppm

**Pacific Ethanol Burley LLC  
Combustion Calculations**

<b>Boiler #1</b>		<b>Natural Gas</b>	
Firing Capacity:	75.6	MMBTU/hr	
Heat Value:	1,020	BTU/cf	
Fuel Burning Capacity:	0.0741	MMcf/hr	
Stack Gas Flow	15,678	dscfm	

<b>Pollutant</b>	<b>Emission Factor* (lb/MMBtu)</b>	<b>Emission Rate (lb/hr)</b>	<b>Max. Uncontrolled Emissions (tpy)</b>
PM	7.45E-03	0.56	2.47
PM <sub>10</sub> /PM <sub>2.5</sub>	7.45E-03	0.56	2.47
SO <sub>2</sub>	5.88E-04	0.04	0.19
NO <sub>x</sub> **	5.00E-02	3.78	16.56
VOC	5.39E-03	0.41	1.78
CO***	3.23E-05	2.39	10.48

\*Emission Factors from Fifth Edition AP-42, Section 1.4, "Natural Gas Combustion", 7/98.

\*\*Based on manufacturer guarantee.

\*\*\*Based on manufacturer estimated emissions of 50 ppm,v, given in lb/cf.

**Pacific Ethanol Burley LLC  
Combustion Calculations**

**Boiler #2**      **Natural Gas**  
 Firing Capacity: 75.6 MMBTU/hr  
 Heat Value: 1,020 BTU/cf  
 Fuel Burning Capacity: 0.0741 MMCf/hr  
 Stack Gas Flow 15,678 dscfm

Pollutant	Emission Factor* (lb/MMBtu)	Emission Rate (lb/hr)	Max. Uncontrolled Emissions (tpy)
PM	7.45E-03	0.56	2.47
PM <sub>10</sub> /PM <sub>2.5</sub>	7.45E-03	0.56	2.47
SO <sub>2</sub>	5.88E-04	0.04	0.19
NO <sub>x</sub> **	5.00E-02	3.78	16.56
VOC	5.39E-03	0.41	1.78
CO***	3.23E-05	2.39	10.48

\*Emission Factors from Fifth Edition AP-42, Section 1.4, "Natural Gas Combustion", 7/98.

\*\*Based on manufacturer guarantee

\*\*\*Based on manufacturer estimated emissions of 50 ppm,V, given in lb/cf.

**Pacific Ethanol Burley LLC  
Combustion Calculations**

**Boiler #3**      **Natural Gas**  
 Firing Capacity: 75.6 MMBTU/hr  
 Heat Value: 1,020 BTU/cf  
 Fuel Burning Capacity: 0.0741 MMCf/hr  
 Stack Gas Flow 15,678 dscfm

Pollutant	Emission Factor* (lb/MMBtu)	Emission Rate (lb/hr)	Max. Uncontrolled Emissions (tpy)
PM	7.45E-03	0.56	2.47
PM <sub>10</sub> /PM <sub>2.5</sub>	7.45E-03	0.56	2.47
SO <sub>2</sub>	5.88E-04	0.04	0.19
NO <sub>x</sub> **	5.00E-02	3.78	16.56
VOC	5.39E-03	0.41	1.78
CO***	3.23E-05	2.39	10.48

\*Emission Factors from Fifth Edition AP-42, Section 1.4, "Natural Gas Combustion", 7/98.

\*\* Based on manufacturer guarantee.

\*\*\*Based on manufacturer estimated emissions of 50 ppm,v, given in lb/cf.

**Pacific Ethanol Burley LLC  
Combustion Calculations**

**HAP Calculations**

Pollutant	Emission Factor* (lb/MMBtu)	Boiler #1		Boiler #2		Boiler #3	
		Potential Emissions (lb/hr)	(tpy)	Potential Emissions (lb/hr)	(tpy)	Potential Emissions (lb/hr)	(tpy)
2-Methylnaphthalene	2.35E-08	1.8E-06	7.8E-06	1.8E-06	7.8E-06	1.8E-06	7.8E-06
3-Methylchloranthrene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
7,12-Dimethylbenz(a)anthracene	1.57E-08	1.2E-06	5.2E-06	1.2E-06	5.2E-06	1.2E-06	5.2E-06
Acenaphthene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Acenaphthylene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Anthracene	2.35E-09	1.8E-07	7.8E-07	1.8E-07	7.8E-07	1.8E-07	7.8E-07
Arsenic	1.96E-07	1.5E-05	6.5E-05	1.5E-05	6.5E-05	1.5E-05	6.5E-05
Benzo(a)anthracene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Benzene	2.06E-06	1.6E-04	6.8E-04	1.6E-04	6.8E-04	1.6E-04	6.8E-04
Benzo(a)pyrene	1.18E-09	8.9E-08	3.9E-07	8.9E-08	3.9E-07	8.9E-08	3.9E-07
Benzo(b)fluoranthene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Benzo(g,h,i)perylene	1.18E-09	8.9E-08	3.9E-07	8.9E-08	3.9E-07	8.9E-08	3.9E-07
Benzo(k)fluoranthene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Beryllium	1.18E-08	8.9E-07	3.9E-06	8.9E-07	3.9E-06	8.9E-07	3.9E-06
Cadmium	1.08E-06	8.2E-05	3.6E-04	8.2E-05	3.6E-04	8.2E-05	3.6E-04
Chromium	1.37E-06	1.0E-04	4.5E-04	1.0E-04	4.5E-04	1.0E-04	4.5E-04
Chrysene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Cobalt	8.24E-08	6.2E-06	2.7E-05	6.2E-06	2.7E-05	6.2E-06	2.7E-05
Dibenzo(a,h)anthracene	1.18E-09	8.9E-08	3.9E-07	8.9E-08	3.9E-07	8.9E-08	3.9E-07
Dichlorobenzene	1.18E-06	8.9E-05	3.9E-04	8.9E-05	3.9E-04	8.9E-05	3.9E-04
Fluoranthene	2.94E-09	2.2E-07	9.7E-07	2.2E-07	9.7E-07	2.2E-07	9.7E-07
Fluorene	2.75E-09	2.1E-07	9.1E-07	2.1E-07	9.1E-07	2.1E-07	9.1E-07
Formaldehyde	7.35E-05	5.6E-03	2.4E-02	5.6E-03	2.4E-02	5.6E-03	2.4E-02
Hexane	1.76E-03	1.3E-01	5.8E-01	1.3E-01	5.8E-01	1.3E-01	5.8E-01
Indeno(1,2,3-cd)pyrene	1.76E-09	1.3E-07	5.8E-07	1.3E-07	5.8E-07	1.3E-07	5.8E-07
Manganese	3.73E-07	2.8E-05	1.2E-04	2.8E-05	1.2E-04	2.8E-05	1.2E-04
Mercury	2.55E-07	1.9E-05	8.4E-05	1.9E-05	8.4E-05	1.9E-05	8.4E-05
Naphthalene	5.98E-07	4.5E-05	2.0E-04	4.5E-05	2.0E-04	4.5E-05	2.0E-04
Nickel	2.06E-06	1.6E-04	6.8E-04	1.6E-04	6.8E-04	1.6E-04	6.8E-04
Phenanthrene	1.67E-08	1.3E-06	5.5E-06	1.3E-06	5.5E-06	1.3E-06	5.5E-06
Pyrene	4.90E-09	3.7E-07	1.6E-06	3.7E-07	1.6E-06	3.7E-07	1.6E-06
Selenium	2.35E-08	1.8E-06	7.8E-06	1.8E-06	7.8E-06	1.8E-06	7.8E-06
Toluene	3.33E-06	2.5E-04	1.1E-03	2.5E-04	1.1E-03	2.5E-04	1.1E-03
<b>Total</b>		0.14	<b>0.61</b>	0.14	<b>0.61</b>	0.14	<b>0.61</b>

\*Emission Factors from AP-42, 5th Edition, Section 1.4, "External Combustion Sources," 798

Pacific Ethanol Burley, LLC  
Fugitive Dust Emissions from Truck Traffic, FS01

AP-42, Section 13.2.2-1

$$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C](1 - (P/4N))$$

Factor	Description	Source	PM Value	PM <sub>10</sub> Value	PM <sub>2.5</sub> Value
E =	Emission factor (lb/VMT)	Calculation, above	1.06	0.21	0.03
k =	PM Particle size multiplier (lb/VMT)	AP-42, Section 13.2.1	0.082	0.016	0.0024
sL =	Road surface silt loading (g/m <sup>2</sup> )	AP-42, Section 13.2.1-2	0.60	0.60	0.60
C =	Vehicle exhaust emission factor		0.0005	0.0005	0.0004
P =	Number of "wet" days in an averaging period		90	90	90
N =	Number of days in an averaging period		365	365	365
W =	Mean vehicle weight (ton)		29.00	29.00	29.0

PM Emissions from Paved Roads

Activity	Quantity Transported per truck	No. of Trucks (truck/yr)	Miles Traveled per Truck (miles/truck)	Annual Mileage (VMT/yr)	Uncontrolled PM Emissions (lb/yr)	Uncontrolled PM Emissions (tpy)
Grain receiving	25 ton	25,169	0.50	12,584	13,306	6.65
Wet Cake haul out	25 ton	24,579	0.50	12,289	12,994	6.50
Ethanol haul out	8,000 gal	7,875	0.32	2,520	2,665	1.33
Denaturant delivery	8,000 gal	375	0.32	120	127	0.06
<b>Total</b>						<b>14.55</b>

PM<sub>10</sub> Emissions from Paved Roads

Activity	Quantity Transported per truck	No. of Trucks (truck/yr)	Miles Traveled per Truck (miles/truck)	Annual Mileage (VMT/yr)	Uncontrolled PM <sub>10</sub> Emissions (lb/yr)	Uncontrolled PM <sub>10</sub> Emissions (tpy)
Grain receiving	25 ton	25,169	0.50	12,584	2,596	1.30
Wet Cake haul out	25 ton	24,579	0.50	12,289	2,535	1.27
Ethanol haul out	8,000 gal	7,875	0.32	2,520	520	0.26
Denaturant delivery	8,000 gal	375	0.32	120	25	0.01
<b>Total</b>						<b>2.84</b>

PM<sub>10</sub> Emissions from Paved Roads

Activity	Quantity Transported per truck	No. of Trucks (truck/yr)	Miles Traveled per Truck (miles/truck)	Annual Mileage (VMT/yr)	Uncontrolled PM <sub>10</sub> Emissions (lb/yr)	Uncontrolled PM <sub>10</sub> Emissions (tpy)
Grain receiving	25 ton	25,169	0.50	12,584	389	0.19
Wet Cake haul out	25 ton	24,579	0.50	12,289	380	0.19
Ethanol haul out	8,000 gal	7,875	0.50	3,938	122	0.06
Denaturant delivery	8,000 gal	375	0.50	188	6	0.00
<b>Total</b>						<b>0.45</b>

**Pacific Ethanol Burley, LLC**  
**Equipment Leak VOC Emissions, FS04**

Process Stream	Equipment Component Source	Product	Component Count*	Emission Factor *** (lb/comp.-hr)	Uncontrolled Rate**** (lb/hr)	LDAR Control Effectiveness	Controlled Rate (lb/hr)	TOC weight** (%)	VOC Emissions (lb/hr)	VOC Emissions (tpy)
Fermentation	Valves	Gas/Vapor	0.0	0.01316	0.00	87%	0.00	13.00%	0.00	0.00
	Valves	Light Liquid	90.0	0.00888	0.80	84%	0.13	13.00%	0.02	0.07
	Pumps	Light Liquid	6.0	0.04387	0.26	69%	0.08	13.00%	0.01	0.05
	Compressor Seals	Gas/Vapor	0.0	0.50265	0.00	75%	0.00	13.00%	0.00	0.00
	Pressure-Relief Valves	Gas/Vapor	5.0	0.22928	1.15	95%	0.06	13.00%	0.01	0.03
	Sampling Connections	All	0.0	0.03307	0.00	87%	0.00	13.00%	0.00	0.00
	Open-ended Lines	All	5.0	0.00376	0.02	84%	0.00	13.00%	0.00	0.00
	Flanges (connectors)	All	166.0	0.00403	0.67	84%	0.11	13.00%	0.01	0.06
	Valves	Gas/Vapor	45.0	0.01316	0.59	87%	0.08	81.70%	0.06	0.28
	Valves	Light Liquid	22.0	0.00888	0.20	84%	0.03	87.10%	0.03	0.12
Distillation	Pumps	Light Liquid	7.0	0.04387	0.31	69%	0.10	81.70%	0.08	0.34
	Compressor Seals	Gas/Vapor	0.0	0.50265	0.00	75%	0.00	81.70%	0.00	0.00
	Pressure-Relief Valves	Gas/Vapor	7.0	0.22928	1.60	95%	0.08	81.70%	0.07	0.29
	Sampling Connections	All	0.0	0.03307	0.00	87%	0.00	81.70%	0.00	0.00
	Open-ended Lines	All	15.0	0.00376	0.06	84%	0.01	81.70%	0.01	0.03
	Flanges (connectors)	All	190.0	0.00403	0.77	84%	0.12	81.70%	0.10	0.44
	Valves	Gas/Vapor	0.0	0.01316	0.00	87%	0.00	100.00%	0.00	0.00
	Valves	Light Liquid	70.0	0.00888	0.62	84%	0.10	100.00%	0.10	0.44
	Pumps	Light Liquid	5.0	0.04387	0.22	69%	0.07	100.00%	0.07	0.30
	Compressor Seals	Gas/Vapor	0.0	0.50265	0.00	75%	0.00	100.00%	0.00	0.00
Tank Farm	Pressure-Relief Valves	Gas/Vapor	5.0	0.22928	1.15	95%	0.06	100.00%	0.06	0.25
	Sampling Connections	All	0.0	0.03307	0.00	87%	0.00	100.00%	0.00	0.00
	Open-ended Lines	All	6.0	0.00376	0.02	84%	0.00	100.00%	0.00	0.02
	Flanges (connectors)	All	110.0	0.00403	0.44	84%	0.07	100.00%	0.07	0.31
			<b>754.0</b>		<b>8.87</b>		<b>1.09</b>		<b>0.69</b>	<b>3.02</b>

\*Component counts are based on Subpart VV equipment inventory from Delta T.

\*\*TOC is considered to be worst case for each process stream identified.

\*\*\*Emission factors taken from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Table 2-1 and Table 5-2.

\*\*\*\*Emission rate is taken from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, and based on the Leak Detection and Repair Program.

**Pacific Ethanol Burley, LLC**  
**Ethanol Loading Rack Emissions**

From Fifth Edition AP-42, Section 5.2:

$$L = 12.46 \cdot S \cdot P \cdot M \cdot T$$

where:

L = Loading Loss, lb VOC/1000 gal of liquid loaded

S = Saturation Factor (AP-42 Table 5.2-1)

P = True Vapor Pressure of Liquid Loaded, psia

M = Molecular Weight of Vapors, lb/lb-mole

T = Temperature of Bulk Liquid Loaded, R

The values of P, T, and M are taken from the TANKS software which calculates the annual average bulk product temperature based on the annual average temperatures for the city of Pocatello, ID. The PTE is based on loading the maximum volume of ethanol that can be distilled by the facility plus denaturant at a concentration of 5 % by volume.

The submerged loading rack for truck loadout employs an air pollution control device (RTO) with a VOC destruction efficiency of 98.0%. As shown, it is conservative to assume all trucks previously carried gasoline and will be controlled using the attached control device.

Product	Annual Throughput (1000 gal)	Saturation Factor S	Vapor Molecular Weight MW	Product Temperature T (deg R)	True Vapor Pressure P (psia)	Loading Loss (lb/1000 gal)	Uncontrolled Loss		Controlled Loss 99%	
							(lb/hr)	(tpy)	(lb/hr)	(tpy)
<b>Rail Loadout</b>										
Denatured Ethanol	63,000	0.6	50.0049	506.04	0.5284	0.3904	2.81	12.30	0.03	0.12
<b>Truck Loadout</b>										
Gasoline	63,000	1	66.0000	506.04	4.1037	6.6689	47.96	210.07	0.48	2.10
Total*									0.48	2.10

\*Loadout is assumed to be 100% truck loadout for most conservative value.



Pacific Ethanol Burely, LLC  
Storage Tanks

Undenatured EOH  
Denaturant  
Denatured EOH  
190 Proof

60,000,000 gal/yr  
3,000,000 gal/yr  
63,000,000 gal/yr  
600,000 gal/yr

Tank	Contents	Throughput	Capacity
TK01	190 Proof (1% of 60,000,000)	600,000 gal/yr	116,800 gallons
TK02	Denaturant	3,000,000 gal/yr	74,300 gallons
TK03	200 Proof Tank (50% of 60,000,000)	30,000,000 gal/yr	116,800 gallons
TK04	200 Proof Tank (50% of 60,000,000)	30,000,000 gal/yr	116,800 gallons
TK05	Denatured EOH (50% of 63,000,000)	31,500,000 gal/yr	500,000 gallons
TK06	Denatured EOH (50% of 63,000,000)	31,500,000 gal/yr	500,000 gallons

	TOTAL Ethanol Emissions (lb/yr) from Tanks 4.09	TOTAL gasoline emissions (lb/yr)	Gasoline (speciated) Cyclohexane 0.5% (lb/year)	Gasoline (speciated) Benzene 2.5% (lb/year)	Gasoline (speciated) Hexane 1.5% (lb/year)	Gasoline (speciated) Pentane 50% (lb/year)	Gasoline (speciated) NeoHexane 31.5% (lb/year)	Gasoline (speciated) Toluene 5% (lb/year)	Gasoline (speciated) Xylene 5% (lb/year)	Gasoline (speciated) Benzene 1.5% (lb/year)	Gasoline (speciated) 1,2,4- Trimethyl benzene 2.5% (lb/year)	Carbon Disulfide 0.005% (lb/year)	Cumene 0.01% (lb/year)
Loadout		4201.39	21.01	105.03	63.02	2100.70	1323.44	210.07	210.07	63.02	105.03	0.21	0.42
TK01	108.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TK02	0.00	1584.81	7.92	39.62	23.77	792.41	499.22	79.24	79.24	23.77	39.62	0.08	0.16
TK03	380.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TK04	380.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TK05	288.89	51.63	0.26	1.29	0.77	25.82	16.26	2.58	2.58	0.77	1.29	0.00	0.01
TK06	288.89	51.63	0.26	1.29	0.77	25.82	16.26	2.58	2.58	0.77	1.29	0.00	0.01
TOTALS (lb/year)	1448.01	1688.07	8.44	42.20	25.32	844.04	531.74	84.40	84.40	25.32	42.20	0.08	0.17
TOTALS (ton/year)	0.72	0.84	0.00	0.02	0.01	0.42	0.27	0.04	0.04	0.01	0.02	0.00	0.00
TOTALS (lb/hr)	0.17	0.19	0.00	0.00	0.00	0.10	0.06	0.01	0.01	0.00	0.00	0.00	0.00

HAP Emissions from Storage Tanks

Pollutant	TK001	TK002	TK003	TK004	TK005	TK006
Storage Tanks						
VOC (lbs/yr)	108.57	1584.81	380.83	380.83	340.52	340.52
VOC (tons/yr)	0.05	0.79	0.19	0.19	0.17	0.17
HAP Fractions						
Benzene	2.50E-02				2.50E-02	2.50E-02
Carbon Disulfide	5.00E-04				5.00E-04	5.00E-04
Cumene	1.00E-04				1.00E-04	1.00E-04
Ethylbenzene	1.50E-02				1.50E-02	1.50E-02
n-Hexane	1.50E-02				1.50E-02	1.50E-02
Toluene	5.00E-02				5.00E-02	5.00E-02
Xylenes	5.00E-02				5.00E-02	5.00E-02
HAP Emissions (tpy)						
Benzene	1.93E-02				2.13E-04	2.02E-02
Carbon Disulfide	3.96E-04				4.26E-06	4.05E-04
Cumene	7.92E-05				8.51E-07	8.09E-05
Ethylbenzene	1.19E-02				1.28E-04	1.21E-02
n-Hexane	1.19E-02				1.28E-04	1.21E-02
Toluene	3.96E-02				4.26E-04	4.05E-02
Xylenes	3.96E-02				4.26E-04	4.05E-02
Total	0.00E+00	1.23E-01	0.00E+00		9.41E-03	1.34E-01

**Pacific Ethanol Burley, LLC**  
**Wetcake Storage Emissions, FS05**

*Wetcake emissions based on November 2, 2004 test data from a wetcake storage building at DENCO, LLC in Morris, MN.*

**Normal Operating Scenario**

Production Rates:

18 tons/hr wetcake (wet basis) production @ DENCO

70.1 tons/hr wetcake (wet basis) production @ Pacific Ethanol Burley LLC (Max)

**DENCO Test Results\* -> Emission Factor -> Burley Estimated Emissions**

Detection?*	Pollutant	DENCO lb/hr @ 18 ton/hr production rate	Emission Factor (lb/ton wetcake)	Potential Estimated Emissions (lb/hr)	Potential Estimated Emissions (tpy)**
non-detect	Acetaldehyde	0.001	5.56E-05	5.85E-03	2.56E-02
non-detect	Acrolein	0.00017	9.17E-06	9.64E-04	4.22E-03
	Acetic Acid	0.08	4.44E-03	4.68E-01	2.05E+00
	Ethanol	0.02	1.11E-03	1.17E-01	5.12E-01
non-detect	Formaldehyde	0.002	1.11E-04	1.17E-02	5.12E-02
non-detect	Formic Acid	---	---	---	---
non-detect	2-furaldehyde	---	---	---	---
non-detect	Methanol	0.00125	6.94E-05	7.31E-03	3.20E-02
<b>VOC Total</b>				0.610	<b>2.67</b>
<b>HAPs Total</b>				0.026	<b>0.11</b>

\*Emission estimates based on November 2, 2004 emission testing at wetcake storage building at

\*\*1/2 the detection limit used as emission estimate for non-detect results.

\*\*\*The VOC total emissions have been increased by 50% to be conservative.

Production Throughputs for Pacific Ethanol Burley, LLC

Undenatured ethanol throughput:	60 MMgal/yr (proposed limit)
Denaturant throughput:	3.000 MMgal/yr (assuming 5% by volume of ethanol produced which is 4% by weight)
Denatured ethanol (fuel) throughput:	63.00 MMgal/yr (denatured ethanol)

Corn Processed:	22.5 MMBu/yr
	629213 tpy
	71.8 ton/hr

Assuming 2.67 gal EtOH per bushel of corn and 56 lb/Bu

Maximum Wetcake Produced	196629 tpy DDGS
	22.4 ton/hr DDGS
	70.1 ton/hr Wetcake

Assuming 17.5 lb DDGS per bushel of corn and wetcake contains 32% DDGS solids

### Process Weight Calculations

Source	Process Weight, lb/hr*	E, Emission Limit, lb/hr	PM Emissions, lb/hr	Meet E?
Corn Receiving Baghouse	840,000	33.301	0.86	Yes
Corn Handling Baghouse	840,000	33.301	0.43	Yes
Corn Bin #1 Spot Filters	840,000	33.301	0.03	Yes
Corn Bin #2 Spot Filters	840,000	33.301	0.03	Yes
Surge Bin Spot Filters	840,000	33.301	0.02	Yes
Hammermilling Baghouse	72,000	18.019	0.39	Yes

$E = 0.045 \cdot (PW)^{0.60}$ , for PW less than 9,250 lb/hr

$E = 1.10 \cdot (PW)^{0.25}$ , for PW greater than 9,250 lb/hr

E= Emission Limit

\* Normal maximum product throughput (tons/hr) converted to lb/hr

**Pacific Ethanol Burley, LLC  
Toxic Air Pollutant Summary**

**TABLE 1. NON-CARCINOGENS**

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)
Acetic Acid	0.468	1.67	N	2.05E+00
Acrolein	0.007106	0.017	N	3.59E-02
Barium	1.00E-03	3.3E-02	N	4.40E-03
Carbon Disulfide	9.63E-06	2.0E+00	N	4.22E-05
Cobalt	1.92E-05	3.3E-03	N	8.40E-05
Copper	1.94E-04	6.7E-02	N	8.50E-04
Cumene	6.64E-05	1.6E+01	N	2.91E-04
Ethanol	8.99E+00	1.3E+02	N	3.94E+01
Ethylbenzene	9.98E-03	2.9E+01	N	4.37E-02
Formic Acid	5.90E-03	6.3E-01	N	3.26E-02
Hexane	4.14E-01	1.2E+01	N	1.81E+00
Manganese	8.67E-05	3.33E-01	N	3.80E-04
Mercury	5.93E-05	3.0E-03	N	7.48E-06
Methanol	2.71E-02	1.7E+01	N	1.53E-01
Molybdenum	2.51E-04	6.67E-01	N	1.10E-03
Naphthalene	1.39E-04	3.33E+00	N	1.75E-05
Pentane	5.93E-01	1.18E+02	N	7.48E-02
Selenium	5.48E-06	1.3E-02	N	2.40E-05
Toluene	1.04E-02	2.5E+01	N	4.56E-02
o-Xylene	9.63E-03	2.9E+01	N	4.22E-02
Vanadium	5.25E-04	3.0E-03	N	6.61E-05
Zinc	6.62E-03	6.67E-01	N	8.34E-04

**TABLE 2. CARCINOGENS**

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)	AACC (ug/m <sup>3</sup> )
Acetaldehyde	0.85085	3.00E-03		5.56E+00	4.50E-01
Arsenic	4.56E-05	1.5E-06		2.00E-04	2.30E-04
Benzene	5.30E-03	8.0E-04		2.32E-02	1.20E-01
Beryllium	2.74E-06	2.8E-05	N	1.20E-05	
Cadmium	2.51E-04	3.7E-06		1.10E-03	5.60E-04
Formaldehyde	2.96E-02	5.1E-04		1.30E-01	7.70E-02
Nickel	4.79E-04	2.7E-05		2.10E-03	4.20E-03
Benzo(a)pyrene	2.74E-07	2.0E-06	N	1.20E-06	
Benz(a)anthracene	4.11E-07	NA	NA	1.80E-06	
Benzo(b,k)fluoranthene	8.21E-07	NA	NA	3.60E-06	
Chrysene	4.11E-07	NA	NA	1.80E-06	
Dibenzo(a,h)anthracene	2.74E-07	NA	NA	1.20E-06	
Indeno(1,2,3-cd)pyrene	4.11E-07	NA	NA	7.39E-13	
Total PAHs	2.60E-06	2.0E-06		9.59E-06	3.40E-04

**Pacific Ethanol Burley, LLC**  
**Toxic Air Pollutant Summary- Scrubbers, Flare, Cake & Tanks**

**NON-CARCINOGENS**

Pollutant	Fermentaion Scrubber (lb/hr)	Vent Gas Scrubber (lb/hr)	Wet cake (lb/hr)	Tanks (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Acetic Acid			4.68E-01		2.0E+00	2.1E+00
Acrolein	4.67E-03	1.47E-03	9.64E-04		3.6E-02	3.6E-02
Carbon Disulfide				9.6E-06	4.2E-05	1.2E-06
Cumene*				1.9E-05	2.9E-04	8.4E-06
Ethanol	7.2E+00	1.5E+00	1.17E-01	1.7E-01	3.9E+01	1.1E+00
Ethylbenzene*				5.6E-02	4.4E-02	1.3E-03
Formic Acid	4.9E-03	1.1E-03			3.26E-02	9.4E-04
Hexane				2.9E-03	1.3E-02	3.7E-04
Methanol	1.8E-02	1.5E-03	7.3E-03		1.5E-01	4.4E-03
Toluene				9.6E-03	4.2E-02	1.2E-03
o-Xylene				9.6E-03	4.2E-02	1.2E-03

\* From ethanol loadout in addition to tanks. The total hourly calculations are:

Cumene	6.6E-05	lb/hr
Ethylbenzene	1.0E-02	lb/hr

**CARCINOGENS**

Pollutant	Fermentaion Scrubber (lb/hr)	Vent Gas Scrubber (lb/hr)	Wet cake (lb/hr)	Tanks (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Acetaldehyde	4.4E-01	4.1E-01	5.9E-03		5.6E+00	1.6E-01
Benzene				4.8E-03	2.1E-02	6.1E-04
Formaldehyde	5.5E-04	2.8E-04	1.2E-02		5.5E-02	1.6E-03

**Pacific Ethanol Burley, LLC**  
**Toxic Air Pollutant Summary- Combustion**

**NON-CARCINOGENS**  
**NATURAL GAS**

Pollutant	Emission Factor (lb/1,000,000 scf)	Emissions (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Barium	4.4E-03	1.0E-03	4.4E-03	1.3E-04
Chromium	1.4E-03	3.2E-04	1.4E-03	4.0E-05
Cobalt	8.4E-05	1.9E-05	8.4E-05	2.4E-06
Copper	8.5E-04	1.9E-04	8.5E-04	2.4E-05
Hexane	1.8E+00	4.1E-01	1.8E+00	5.2E-02
Manganese	3.8E-04	8.7E-05	3.8E-04	1.1E-05
Mercury	2.6E-04	5.9E-05	2.6E-04	7.5E-06
Molybdenum	1.1E-03	2.5E-04	1.1E-03	3.2E-05
Naphthalene	6.1E-04	1.4E-04	6.1E-04	1.8E-05
Pentane	2.6E+00	5.9E-01	2.6E+00	7.5E-02
Selenium	2.4E-05	5.5E-06	2.4E-05	6.9E-07
Toluene	3.4E-03	7.8E-04	3.4E-03	9.8E-05
Vanadium	2.3E-03	5.2E-04	2.3E-03	6.6E-05
Zinc	2.9E-02	6.6E-03	2.9E-02	8.3E-04

**CARCINOGENS**  
**NATURAL GAS**

Pollutant	Emission Factor (lb/1,000,000 scf)	Emissions (lb/hr)	Emissions (tons/yr)	Emissions (grams/sec)
Arsenic	2.0E-04	4.6E-05	2.0E-04	2.5E-05
Benzene	2.1E-03	4.8E-04	2.1E-03	2.6E-04
Beryllium	1.2E-05	2.7E-06	1.2E-05	1.5E-06
Cadmium	1.1E-03	2.5E-04	1.1E-03	1.4E-04
Formaldehyde	7.5E-02	1.7E-02	7.5E-02	9.4E-03
Nickel	2.1E-03	4.8E-04	2.1E-03	2.6E-04
Benzo(a)pyrene	1.2E-06	2.7E-07	1.2E-06	1.5E-07
Benz(a)anthracene	1.8E-06	4.1E-07	1.8E-06	2.3E-07
Benzo(b)fluoranthene	1.8E-06	4.1E-07	1.8E-06	2.3E-07
Benzo(k)fluoranthene	1.8E-06	4.1E-07	1.8E-06	2.3E-07
Chrysene	1.8E-06	4.1E-07	1.8E-06	2.3E-07
Dibenzo(a,h)anthracene	1.2E-06	2.7E-07	1.2E-06	1.5E-07
Indeno(1,2,3-cd)pyrene	1.8E-06	4.1E-07	7.4E-13	9.3E-14
Total PAHs	1.1E-05	2.6E-06	1.1E-05	1.4E-06

Total gas consumption = 0.228 MMscf/hr

Notes: Emissions based on boiler operating at maximum rate of 0.0741 mmscf/hr for each of the three boilers.  
RTO fuel consumption is 5,882 scf/hr  
Assumed 1,020 BTU/scf heat content of natural gas.  
Emissions based on 8,760 hours/year of operation.

Source: AP-42 Tables 1.4-3 and 1.4-4, 7/98.

Note: For small natural gas boiler

**Daniel Heiser**

---

**From:** Steve Graves [sgraves@campbell-sevey.com]  
**Sent:** Friday, November 03, 2006 3:00 PM  
**To:** dheiser@jbrenv.com  
**Subject:** RE: Pacific Ethanol Boiler Emissions

Hi Daniel-

We will providing two (2) 1800 HP Superior boilers with John Zink/GP RMB burners for the Burley, ID project . The burners are rated for 75,600 mbtu input each. The burners are guaranteed to be below the listed levels stated here in your email.

We can meet the NOx levels of 0.05#/mmbtu and the CO levels of 50 ppm.

We have provided many similar boiler systems that have met these requirements in the Ethanol Industry.

Please let me know if you need any additional information.

Thanks,

Steve

-----Original Message-----

**From:** Daniel Heiser [mailto:dheiser@jbrenv.com]  
**Sent:** Friday, November 03, 2006 3:49 PM  
**To:** Steve Graves  
**Cc:** 'Melissa Armer'; 'Cheryl Pagard'  
**Subject:** Pacific Ethanol Boiler Emissions

Steve,

For the pacific Ethanol, Burley project, please confirm the following for the boilers:

- 50 ppm CO
- NOx at 0.05 lb/MMBTU

Thank you,



environmental consultants, inc.  
Daniel Heiser, P.E.  
7669 West Riverside Drive, Suite 101  
Boise, ID 83714  
208.853.0883 (phone)  
208.853.0884 (fax)  
208.841.4684 (cell)



# **STACK TEST DATA**

***Pacific Ethanol Burley***

***Fermentation, Distillation and Wet Cake Data***

***October, 2006***



Pacific Ethanol, Inc.



## EXECUTIVE SUMMARY

Emissions Testing  
Ace Ethanol, LLC – Stanley, Wisconsin  
American Engineering Testing, Inc. September 14-16 & October 18-19, 2004

Performance testing was conducted at the Regenerative Thermal Oxidizer (RTO), Beerwell Scrubber, Ventgas Scrubber, CO<sub>2</sub> Scrubber, North Boiler, South Boiler and the Old Dryer from September 14-16 and October 18-19, 2004. The test results are summarized below:

### **Regenerative Thermal Oxidizer (RTO) (S40)**

<u>Particulate Matter Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	<u>Limits</u>
Total Particulate Matter, gr/dscf:	0.00990	0.0103	0.00919	0.0098	0.025
Total Particulate Matter, lbs/hr:	2.89	3.09	2.75	2.9	7.0

<u>VOC Destruction Efficiency Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	
RTO Inlet, lbs/hr as C3:	52.9	52.3	50.7	52.0	
RTO Outlet lbs/hr as C3:	1.05	0.802	0.935	0.927	
VOC Destruction Efficiency, %	98.0%	98.5%	98.2%	98.2%	96%

<u>Speciated VOC Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	
Acetaldehyde, lbs/hr:	< 0.118	< 0.120	< 0.121	< 0.12	
Methanol, lbs/hr:	< 0.118	< 0.120	< 0.121	< 0.12	
Ethanol, lbs/hr:	< 0.118	0.200	< 0.121	< 0.15	
2-Furaldehyde, lbs/hr:	< 0.034	< 0.034	< 0.0344	< 0.034	
Formic Acid, lbs/hr:	< 0.084	< 0.086	< 0.0863	< 0.085	
Acetic Acid, lbs/hr:	0.706	0.709	0.722	0.71	
Formaldehyde, lbs/hr:	0.0461	0.0430	0.0447	0.045	
Total Speciated VOC's, lbs/hr:	< 1.22	< 1.31	< 1.25	< 1.3	2.7

<u>Carbon Monoxide Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	
Carbon Monoxide, ppmv:	55	52	42	50	< 100 ppm
Carbon Monoxide, lbs/hr:	8.8	8.3	6.6	7.9	14.2

<u>Oxides of Nitrogen Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	
Oxides of Nitrogen, lbs/hr:	7.2	7.1	5.8	6.7	8.6, 0.08 lb/hr Etn

### **Beerwell Scrubber (S21)**

<u>VOC Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Beerwell Scrubber Outlet lbs/hr as C3:	0.00242	0.00303	0.00483	0.0034

<u>Speciated VOC Emission Results</u>	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>	
Acetaldehyde, lbs/hr:	< 0.000611	< 0.000649	< 0.000704	< 0.00065	
Methanol, lbs/hr:	< 0.000611	< 0.000649	< 0.000402	< 0.00055	
Ethanol, lbs/hr:	0.00446	0.00750	0.00617	0.0060	
2-Furaldehyde, lbs/hr:	< 0.000175	< 0.000185	< 0.000115	< 0.00016	
Formic Acid, lbs/hr:	< 0.000437	< 0.000450	< 0.000287	< 0.00039	
Acetic Acid, lbs/hr:	< 0.000437	< 0.000450	< 0.000287	< 0.00039	
Formaldehyde, lbs/hr:	< 0.0000873	< 0.0000900	< 0.0000574	< 0.000078	
Total Speciated VOC's, lbs/hr:	< 0.00682	< 0.0100	< 0.00802	< 0.0083	0.73

**EXECUTIVE SUMMARY, PAGE 2**

SD averaged / yr Eth. Prod.

Emissions Testing  
Ace Ethanol, LLC – Stanley, Wisconsin  
American Engineering Testing, Inc. September 14-16 & October 18-19, 2004

**Ventgas Scrubber (S20)****VOC Emission Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Ventgas Scrubber Outlet lbs/hr as C3:	0.121	0.212	0.0290	0.12

**Speciated VOC Emission Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Acetaldehyde, lbs/hr:	0.212	0.416	0.0350	0.22
Methanol, lbs/hr:	< 0.000786	< 0.000984	< 0.000604	< 0.00079
Ethanol, lbs/hr:	0.0212	0.00932	0.00231	0.011
2-Furaldehyde, lbs/hr:	< 0.000224	< 0.000281	< 0.000172	< 0.00023
Formic Acid, lbs/hr:	< 0.000561	< 0.000703	< 0.000432	< 0.00057
Acetic Acid, lbs/hr:	< 0.000561	< 0.000703	< 0.000432	< 0.00057
Formaldehyde, lbs/hr:	< 0.000112	0.000266	< 0.0000861	< 0.00015
Total Speciated VOC's, lbs/hr:	< 0.235	< 0.428	< 0.0390	< 0.23

**CO<sub>2</sub> Scrubber (S22)****VOC Removal Efficiency Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
CO <sub>2</sub> Scrubber Inlet, lbs/hr as C3:	114	111	100	108
CO <sub>2</sub> Scrubber Outlet, lbs/hr as C3:	0.797	0.721	0.942	0.820
VOC Removal Efficiency, %	99.3%	99.3%	99.1%	99.2%

**Speciated VOC Emission Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Acetaldehyde, lbs/hr:	0.228	0.300	0.239	0.26
Methanol, lbs/hr:	0.00870	0.00422	0.00334	0.0054
Ethanol, lbs/hr:	0.299	0.289	0.635	0.41
2-Furaldehyde, lbs/hr:	< 0.00149	< 0.000956	< 0.000768	< 0.0011
Formic Acid, lbs/hr:	< 0.00320	< 0.00240	< 0.00192	< 0.0025
Acetic Acid, lbs/hr:	< 0.00320	< 0.00240	< 0.00192	< 0.0025
Formaldehyde, lbs/hr:	< 0.000320	< 0.000240	< 0.000192	< 0.00025
Total Speciated VOC's, lbs/hr:	< 0.543	< 0.599	< 0.882	< 0.67

**South Boiler (S51)****Oxides of Nitrogen Emission Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Oxides of Nitrogen, lbs/hr:	2.0	1.9	1.8	1.9

**North Boiler (S50)****Oxides of Nitrogen Emission Results**

	<u>Test #1</u>	<u>Test #2<sup>(1)</sup></u>	<u>Test #3</u>	<u>Test #4</u>	<u>Average</u>
Oxides of Nitrogen, lbs/hr:	2.7	2.6	2.6	2.6	2.6

(1) Test #2 oxygen results are suspect due to a possible oxygen sample bag leak. Results are presented here but are not included in the averages

**Old DDGS Dryer****Oxides of Nitrogen Emission Results**

	<u>Test #1</u>	<u>Test #2</u>	<u>Test #3</u>	<u>Average</u>
Oxides of Nitrogen, lbs/hr:	1.6	1.7	1.8	1.7

Interpoll Laboratories, Inc.  
4500 Ball Road N.E.  
Circle Pines, Minnesota 55014-1819

TEL: (763) 786-6020  
FAX: (763) 786-7854

**RESULTS OF THE NOVEMBER 2, 2004  
AIR EMISSION COMPLIANCE TEST ON  
THE SPENT GRAINS BUILDING EXHAUST AT THE  
DIVERSIFIED ENERGY FACILITY IN MORRIS, MINNESOTA**

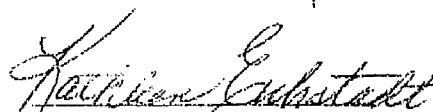
Submitted to:

**NATURAL RESOURCE GROUP**  
1000 IDS Center  
80 South Eighth Street  
Minneapolis, MN 55402

Attention:

Dave Myers

Reviewed by:



Kathleen Eickstadt  
Coordinator  
Source Testing Department

Report Number 4-20825  
December 13, 2004  
KE/kce

## 2 SUMMARY AND DISCUSSION

The results of the air emission compliance tests are summarized in Tables 1-3. An overview is presented below.

PARAMETER	RESULTS			
	Run 1	Run 2	Run 3	
EPA METHOD 25A				
..... (ppm,w as carbon)	7.17	7.33	5.78	
..... (LBC/HR as carbon)	0.07	0.07	0.06	0.07
(LB/HR as ethanol using ethanol response factor)	0.16	0.16	0.13	0.15
EPA METHOD 18 TOTAL MASS RATE				
.....(LB/HR)	≤ 0.12	≤ 0.06	≤ 0.15	0.11

No difficulties were encountered in the field or in the evaluation of the samples. On the basis of these facts and a complete review of the data and results, it is our opinion that the concentrations and emission rates reported herein are accurate and closely reflect the actual values which existed at the time the tests were performed.

Test Number 1  
Spent Grains Storage Building Vent

### Results of Method 18 Determinations

			Run 1		Run 2		Run 3		Average
Date of Test			11-02-04		11-02-04		11-02-04		
Time of Runs	(Hrs)	0810 /	0909	0940 /	1039	1105 /	1204		
Total Sampling Time	(Min.)		60.0		60.0		60.0		
Volumetric Flow Rate	(DSCFM)		5,211		4,942		5,069		5,074
			<u>Normal Train</u>	<u>Spike Train</u>	<u>Normal Train</u>	<u>Spike Train</u>	<u>Normal Train</u>	<u>Spike Train</u>	<u>Spike</u>
Liters Sampled			18.45	22.24	20.31	19.65	16.94	15.86	<b>Recovery</b>
Spike ml added	(ml)			0.50		0.50		1.00	<b>(%)</b>
Acrolein									
ug/L		<	0.02	0.06 <	0.02	0.09 <	0.02	0.19	
ppm		<	0.0076	0.0257 <	0.0073	0.0365 <	0.0085	0.0813	
LB/HR		<	0.0003	<	0.0003	<	0.0004		
				75.09		94.12		84.54	<b>84.58</b>

Test Number 2  
Spent Grains Storage Building Vent

## Results of Method 18 Determinations

			Run 1		Run 2		Run 3		Average
Date of Test			11-02-04		11-02-04		11-02-04		
Time of Runs	(Hrs)	0810 /	0909	0940 /	1039	1105 /	1204		
Total Sampling Time	(Min.)		60.0		60.0		60.0		
Volumetric Flow Rate	(DSCFM)		5,211		4,942		5,069		5,074
			Normal Train	Spike Train	Normal Train	Spike Train	Normal Train	Spike Train	Spike Recovery
Liters Sampled			19.28	18.76	20.51	19.86	17.55	17.85	
Spike ml added	(ml)			1.0		1.0		1.0	(%)
Acetaldehyde									
ppm		≤	0.11	0.95 ≤	0.04	0.90 ≤	0.06	1.41	
LB/HR		≤	0.003	≤	0.001	≤	0.002		
				104.30		96.27		146.75	115.77
Methanol									
ppm		<	0.00	1.50 <	0.00	1.41 ≤	0.09	1.30	
LB/HR		<	0.00	<	0.00	≤	0.0025		
				98.48		97.78		75.57	90.61
Ethanol									
ppm			0.80	1.57	0.57	1.44	0.56	1.39	
LB/HR			0.03		0.02		0.02		
				80.59		96.26		138.68	105.17
Formaldehyde									
ppm		≤	0.18	0.47 ≤	0.14	0.45 ≤	0.19	0.52	
LB/HR		≤	0.0043	≤	0.0032	≤	0.0044		
				125.38		88.08		84.90	99.46
Acetic Acid									
ppm			1.67	3.05	1.02	2.53	2.81	4.27	
LB/HR	0.04		0.08		0.04		0.13		
				99.77		115.31		100.07	105.05
2-Furaldehyde									
ppm		<	0.00	1.91 <	0.00	0.49 <	0.00	0.54	
LB/HR		<	0.00	<	0.00	<	0.00		
				73.58		75.84		74.56	74.66
Formic Acid									
ppm		<	0.00	<	0.00	<	0.00		
LB/HR		<	0.00	<	0.00	<	0.00		

## TNM-VOC = Total Non-Methane VOC

	Run 1	Run 2	Run 3	Average
TNM-VOC Mass Rate as Method 25A (LB/HR reported as Carbon)	0.07	0.07	0.06	0.07
TNM-VOC Mass Rate as Method 25A (LB/HR reported as Ethanol)	0.16	0.16	0.13	0.15
TNM-VOC Mass Rate as Method 18	≤ 0.12	≤ 0.06	≤ 0.15	0.11

\*\*\*\* Note: Mass Rates are corrected for the average spike recovery value.

Test 3 Summary of the Results of the November 2, 2004, VOC Emission Compliance Test on the Spent Grains Storage Building Vent at the DENCO Ethanol Plant located in Morris, Minnesota.

Date of test	Item	Run 1 11-02-04	Run 2 11-02-04	Run 3 11-02-04	Average
Time runs were done	(Hrs)	0810 / 0909	0940 / 1039	1105 / 1204	
Volumetric Flow					
Actual	(ACFM)	5,165	5,187	5,349	5,233
Standard	(DSCFM)	5,148	4,942	5,069	5,053
Gas Temperature	(°F)	51	66	70	63.00
Moisture Content	(%v/v)	1.04	2.25	2.41	1.90
Gas Composition	(%v/v, dry)				
Carbon Dioxide		0.03	0.03	0.03	0.03
Oxygen		20.90	20.90	20.90	20.90
Nitrogen		79.07	79.07	79.07	79.07
VOC Results					
VOC					
Concentration	(ppm, w as Carbon)	7,166	7,333	5,783	6,76
Emission Rate	(LB/HR as Carbon)	0.07	0.07	0.06	0.07
Emission Rate	(LB/HR as Ethanol)	0.16	0.16	0.13	0.15



**FILTER EMISSIONS STATEMENT  
FOR  
16 oz. Dacron Polyester Bags**

Agra Industries, Inc. warrants its filters to be free of mechanical defects for a period of one year from the date of shipment in accordance with the "Warranty and Limitation" statement included with the original proposal.

Agra Industries, Inc. also expects the emissions of its new 16 oz. Dacron Polyester bags, when properly installed, applied and maintained, and when operated per the design parameters referenced in the original proposal and in accordance with the manufacturers operations manuals, will emit no more than 0.005 gr / dscf of air.

The Buyer will be responsible for any emissions testing expense and Agra Industries, Inc. reserves the right to be present during any emission tests and shall be notified at least 2 weeks prior to the testing. Emissions testing must be conducted within 30 days of start-up, or 60 days from equipment shipment.

Misuse, abuse, operating outside the stated parameters, and / or water, oil, or hydrocarbons will void the emissions expectation. Agra Industries, Inc. shall not be held responsible for any failures or excess emissions due to upset operating conditions.

This emissions expectation is contingent upon Agra Industries, Inc. receiving a process dust sample for testing, analysis, and approval. Such testing could indicate another filter media as a more suitable choice. The expected emissions are also contingent upon an inlet grain loading acceptable to Agra Industries, Inc.

Under no circumstances will Agra Industries, Inc. be liable or responsible for incidental or consequential damages.



Daniel Dillinger  
Product Engineer, Agra Industries, Inc.  
6/10/05



323 Alexander Lee Parkway  
Williamsburg, VA 23185  
Tel 757 220 2955  
Fax 757 229 1705

December 12, 2005

Ms. Cheryl Pagard  
Natural Resource Group  
1515 Arapaho Street  
Suite 580, Tower 1  
Denver, CO 80202

Dear Ms. Pagard,

The following is in reference to the scrubber design for the Pacific Ethanol facilities at Brawley, Stockton and Visalia, CA

1. The Fermentation Scrubber is a custom Delta-T Corporation design. The Fermentation Scrubber Column is an ASME Coded Vessel, whose construction is competitively bid among manufacturers who are certified and pre-qualified to fabricate this type of vessel. The column is packed with random polypropylene packing. The column is designed to remove over 98.5% of the total organic contaminants from the fermentation vent stream using approximately 125 GPM of fresh water. The expected contaminants include: ethanol, acetic acid, lactic acid, acetaldehyde, formaldehyde, acrolein, ethyl acetate, 2-furaldehyde and methanol. The cleaned CO<sub>2</sub> is sent directly to the regenerative thermal oxidizer (RTO) on site. Scrubbing water is returned to the Slurry Mix Tank as make-up water via the Process Condensate Tank. Performance of these scrubbers in existing Delta-T designed facilities have been verified using EPA Method 25A for total VOC's as well as speciated testing.
2. The Vent Gas Scrubber is a custom Delta-T Corporation design and is similar to the Fermentation Scrubber in construction. The column is also packed with random polypropylene packing. The column is designed to remove over 98.5% of the total organic contaminants from the distillation and evaporation system vents using approximately 25 GPM of fresh water. The expected contaminants include: ethanol, acetic acid, lactic acid, acetaldehyde, formaldehyde, acrolein, ethyl acetate, 2-furaldehyde and methanol. The cleaned stream is sent directly to the atmosphere. Scrubbing water is returned to the Slurry Mix Tank as make-up water via the Process Condensate Tank. Performance of these scrubbers in existing Delta-T designed facilities have been verified using EPA Method 25A for total VOC's as well as speciated testing.

Please contact me if you require any additional information.

Best regards,

Dale Patnaude P.E.  
Process Engineering Manager  
Delta-T Corporation

# NESTEC Inc.

Environmental Products for Industrial Solutions

1601 Moyer Rd., Telford, PA 18969 (215-234-8188)

November 1, 2006

Cheryl Pagard  
Pacific Ethanol  
516 Southeast Morrison St.  
Portland, OR 97214

Subject: NESTEC, Inc. RTO Proposal No. 0611206RTO

Dear Cheryl:

NESTEC, Inc. is pleased to provide you with the enclosed unpriced technical proposal for a Regenerative Thermal Oxidizer (RTO) system to control VOC and CO emissions for your fermentation and distillation scrubber at your Burley Idaho plant. Our proposal is based on a process flow with dilution air of 13,200 wet-SCFM which will need to be corrected for temperature and elevation. The two chamber poppet valve design has been used effectively in the ethanol industry as well as other application where high moisture and low oxygen are critical design parameters.

Included in the proposal I have attached test results from a projects recently executed which had similar low oxygen process conditions. As you will see the results were excellent and we have included the same engineering concepts to this design. In fact we have intentionally oversized the recovery chamber to allow for flexibility with outside air dilution to vary the oxygen levels in the process to control oxygen levels and provide more efficient combustion. During system testing the flows will be optimized for minimal fuel consumption. Also included is a general arrangement drawing to show overall dimensions

The system is designed with 95% thermal energy recovery and 99% VOC destruction efficiency. The costing found in section 4.0, of this proposal, details pricing for the RTO equipment with mechanical and electrical installation.

Based on our phone conversation, we have provided a complete design package per your design requirements. This offering includes a mastic lined carbon steel housing with stainless steel material in all areas which have direct contact with the process stream, induced draft fan arrangement with 304L SS housing for protection against particulate and moisture and increased fan life.

We hope you find the enclosed information to be complete and adequate, should you have any question or require additional information please contact me @ (215) 234-8188.

Regards,

James L. Nester  
NESTEC, Inc.

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## 1.0 SCOPE OF SUPPLY

One (1) 13,200 wet-SCFM RTO system designed for 99% VOC destruction efficiency and 95% thermal efficiency.

Scope of Supply	Included	Excluded	N/A	Option
• RTO housing including, recovery and combustion chambers (Mild Steel)	X			
• Oxidizer ceramic blanket internal insulation	X			
• RTO inlet pre-heat system		X		
• Heat recovery media	X			
• Natural gas burner system with fuel train	X			
• Bake-out feature	X			
• Two-way fast action poppet valves with pneumatic actuators (304L Stainless Steel)	X			
• Induced draft fan	X			
• ID Fan motor (460 volt)	X			
• Variable frequency drive	X			
• Inlet and outlet manifold (304L Stainless Steel)	X			
• External manifold insulation		X		
• Main exhaust stack 35'-0" above grade with access platform.	X			
• Burner access platform and ladder	X			
• Main control panel pre-wired and shop tested	X			
• Local disconnects		X		
• Isolation and Purge valves (304L)	X			
• Foundation		X		
• Mechanical and electrical installation				X
• Start-up and operator training	X			
• Freight to job site (Pre-paid and add)		X		
• O&M Manuals	X			
• Compliance Testing		X		

## **2.0 WORK BY OTHERS**

The Buyer will provide the following services and equipment. The scope of supply will include, but not be limited to the following:

- Furnish and install service power with one (1) 100-amp service at 460 volt, 3 phase, 60 hertz to a circuit breaker at the control panel location. The oxidizer main control panel is to be located in the buyers main control room.
- Furnish and install service power with one (1) 40-amp service at 120 volt, 1 phase, 60 hertz the control panel location. The oxidizer main control panel is to be located in the buyer's main control room.
- Isolation transformer or line reactor if voltage is prone to harmonics or spikes.
- Provide adequate lay down area for off-loading and storage of equipment.
- Supply natural gas at 2,500-cfh @ 5.0-psi to the gas train connection point adjacent to the oxidizer.
- Supply compressed air @ 2-4 scfm (minimal) @ 100psi@ -40°F dew point to the oxidizer location.
- All local disconnects.
- Compliance testing by independent third party to establish hydrocarbon destruction efficiency.
- Provide field supervisor office facility, with phone line.
- Provide any and all local, state or federal agency permits or special clearance requirements.
- Provide adequate down time for tie-in of the oxidizer system.
- Process exhaust ductwork to the RTO inlet manifold.
- Soil testing, if required.
- All sales, state and local taxes, if required.

### **3.0 PROCESS DESIGN CONDITIONS**

The equipment will be designed to operate in accordance with the design information provided in Buyer's request for quotation dated October 31, 2006. A summary of these design conditions is given below:

<b>DESIGN CONDITIONS</b>	
	<b>DRYER EXHAUST</b>
RTO Design Volume ( wet-SCFM)	13,200
Process Exhaust Temperature (°F)	65-75°F
Elevation	275 FASL
Moisture Content (% by volume)	4.5%
VOC Concentration	10.5 #/hr
VOC Net Heating Value (BTU/#)	11,246
Required Destruction Efficiency (%)	99
Oxidation Temperature (°F)	1,500 - 1,750
Oxidizer Thermal Energy Recovery (%)	95

### **4.0 PRICE OF EQUIPMENT**

Not Applicable

### **5.0 PROJECT SCHEDULE**

NESTEC, INC. will ship equipment within 18-20 weeks after receipt of final approval drawings. Initial approval drawings will be generated within 3-4 weeks upon receipt and acceptance of written purchase order. Installation and start-up will require an additional 3-4 weeks.

## **6.0 FUEL AND POWER CONSUMPTION**

Fuel and power consumption calculations are based on the design criteria as outlined in Section 1.0 of this proposal. Performance calculations are for comparison purposes only and will vary based on process conditions, ambient conditions and burner settings.

### **Power Consumption:**

- Power costs are based on a utility cost of \$ 0.08/kw-hr
- The oxidizer fan horsepower calculation is based on a process ductwork static pressure requirement of -2.0"w.c.
- Kilowatt calculations are based on 95% motor efficiency and a power factor of 97%

### **Fuel Consumption:**

- Fuel costs are based on a utility cost of \$8.00/MMBTU
- Natural gas heating value is assumed @ 1,000 BTU/ft<sup>3</sup>
- Ambient conditions are assumed at 70°F and 5 mph wind velocity
- All fuel calculations include process heat load requirements, combustion air heat load requirements with 30% excess air, and oxidizer housing radiant heat load requirements.



**System Design Basis**

	<u>Maximum</u>	<u>Average</u>	<u>Minimum</u>	
Airflow				
Volumetric flow rate	12,750	5,808	5,981	DSCFM
Humidity ratio	0.024	0.024	0.029	#H <sub>2</sub> O/#air
Elevation	925	925	925	Ft ASL
Temperature	109	109	88	°F
Contaminant Rate	10.5	10.5	3.2	#/hr
Contaminant Concentration	0	0	0	PPM <sub>w</sub> as VOC
Average higher heating value	10,591	10,591	10,591	
Lowest autoignition temperature			347	°F
Average molecular weight			59.5	# / #-mole

Contaminants	Rate (#/hr)	Molecular Weight		AIT (°F)	Heat of Combustion (Gross)	
Inorganic Compounds						
Oxygen	5,247	32.0	-	-	0	0
Nitrogen	17,292	28.0	-	-	0	0
Water Vapor	1,400	18.02	-	-	0	0
Carbon Dioxide	52,428	44.0	-	-	0	0
Sulfur Dioxide	0	64.1	-			
Combustion Air	0	28.95	-			
VOC and HAP Compounds		76,367				
1 Methanol	0.11	32.0	0.32	867	9,000	945
2 Ethanol	2.63	46.1	11.52	685	12,800	33,600
3 Formaldehyde	0.11	30.0	0.30	572	6,300	662
4 Acetaldehyde	3.47	44.1	14.54	347	11,400	39,501
5 Acrolein	0.11	56.1	0.56	455	12,500	1,313
6 Lactic Acid	0.53	90.1	4.50	-	0	0
7 Furfuraldehyde	0.11	96.1	0.96	601	9,740	1,023
8 Acetic Acid	0.84	60.1	4.80	869	6,300	5,292
9 Ethyl Acetate	2.63	88.1	22.03	800	11,000	28,875
10 Gasoline Vapors	0.00	92.3	0.00	440	21,000	0
Natural Gas Input		10.50				
Methane	0	16.0	0.00			
Particulate	0					
VOC Totals		11	59.53	347	10,591	111,210

Properties of process air:

Actual volumetric flow rate	14,688	6,691	6,621	ACFM
Water moisture, standard	499	227	214	SCFM <sub>(H<sub>2</sub>O)</sub>
Specific volume	15.36	15.36	14.76	Ft <sup>3</sup> moist air
Total SCFM <sub>(wet)</sub>	13,249	6,035	6,196	SCFM <sub>(wet)</sub>
Pressure at inlet of oxidizer:	-2.0	-2.0	-2.0	inches w.c.
Oxygen content	8.0%	6.4%	6.5%	(by volume)

**Thermal Oxidizer Electrical Consumption Data**

	<u>Maximum</u>	<u>Average</u>	<u>Minimum</u>
Process volume into oxidizer:	14,688 ACFM	6,691 ACFM	6,621 ACFM
Pressure at oxidizer inlet:	-2.0 " w.c.	-2.0 " w.c.	-2.0 " w.c.
Oxidizer energy recovery:	95%	95%	95%
Oxidizer purification temperature:	1,650 °F	1,650 °F	1,650 °F
Oxidizer exhaust temperature:	217 °F	209 °F	166 °F
Oxidizer exhaust fan location:	Outlet	Outlet	Outlet
Pressure drop across oxidizer	14.8 " w.c.	3.1 " w.c.	3.0 " w.c.
Process volume at fan inlet	18,061 ACFM	6,691 ACFM	6,621 ACFM
Fan efficiency	65%	65%	65%
Brake Horsepower required	64.8 BHP	5.0 BHP	4.8 BHP
Net electrical energy required:	48.0 kW/hr	3.7 kW/hr	3.6 kW/hr
Hourly fuel electrical use at \$ 0.046 /kWhr:	\$ 2.21 /hr	\$ 0.17 /hr	\$ 0.16 /hr
Annual operation	800 hrs/yr	7,400 hrs/yr	200 hrs/yr
Annual electrical cost	\$ 1,765 /yr	\$ 1,255 /yr	\$ 33 /yr
<b>Total annual electrical cost</b>		<b>\$ 3,052</b>	

The above electrical analysis is for comparison purposes only and will vary depending on power factor and motor efficiency.

**Thermal Oxidizer Fuel Consumption Data**

	<b><u>Maximum</u></b>	<b><u>Average</u></b>	<b><u>Minimum</u></b>
Process volume into oxidizer:	14,688 ACFM	6,691 ACFM	6,621 ACFM
Process temperature into oxidizer:	109 °F	109 °F	88 °F
Process water vapor rate into oxidizer:	1,400 lbs/hr	638 lbs/hr	781 lbs/hr
Dry air rate into oxidizer:	12,750 DSCFM	5,808 DSCFM	5,981 DSCFM
Oxidizer energy recovery:	93%	94%	95%
Oxidizer purification temperature:	1,650 °F	1,650 °F	1,650 °F
Oxidizer exhaust temperature:	217 °F	209 °F	166 °F
Temperature increase, with no contaminants:	108 °F	100 °F	78 °F
Net energy required:	1,552,640 Btu/Hr	656,754 Btu/Hr	531,490 Btu/Hr
Contaminant rate:	10.50 Lbs/Hr	10.50 Lbs/Hr	3 Lbs/Hr
Heat release from contaminants at 10,591 BTU/#:	100,089 Btu/Hr	100,089 Btu/Hr	30,503 Btu/Hr
Net fuel energy required:	1,452,551 Btu/Hr	556,666 Btu/Hr	500,986 Btu/Hr
Available energy (latent and sensible heat loss correction factor):	86.4%	86.6%	87.6%
Gross fuel energy required:	1,680,286 Btu/Hr	642,642 Btu/Hr	571,985 Btu/Hr
Hourly fuel use at 1,000 Btu/Ft3:	1,680.29 Ft3/Hr	642.64 Ft3/Hr	571.99 Ft3/Hr
Hourly fuel use at \$ 10.00 MM/Btu:	\$ 16.80 /Hr	\$ 6.43 /Hr	\$ 5.72 /Hr
Annual operation	800 Hrs / Yr	7,400 Hrs / Yr	200 Hrs / Yr
Annual fuel cost	\$ 13,442 per year	\$ 47,555 per year	\$ 1,144 per year
<b>Total annual fuel cost:</b>		<b>\$ 62,142 per year</b>	

The above fuel analysis is for comparison purposes only and will vary depending on burner adjustment and radiation losses.

## **7.0 PERFORMANCE GUARANTEE/WARRANTY**

The thermal oxidation system offered in this proposal is guaranteed to reduce the VOC emissions emanating from Buyer's process by 99% (on a methane free basis), providing the following:

1. The equipment is operated in accordance with Seller's written operating and maintenance instructions.
2. The equipment is operated within the design conditions as specified in Section 3.0 of this proposal.

Testing to determine if the equipment offered is in compliance with the terms of the guarantee described above may be conducted by Buyer. Such testing shall be conducted in accordance with the following:

1. The testing methods to be used to show compliance are as follows:

VOC	US EPA Method 25A
Methane	US EPA Method 18
2. Testing shall be performed by an independent test firm that meets the approval of both the Buyer and Seller.
3. Seller shall be notified at least 10 days in advance of the testing and shall be permitted to have a field service engineer present during the test. The field service engineer shall have the opportunity to adjust the equipment prior to testing in order to obtain optimum performance.
4. At least three, one hour performance test runs shall be conducted.
5. Testing shall be conducted within 60 days of start-up contingent upon the availability of an approved local testing firm to perform the tests.

The equipment shall be considered to be in compliance with the terms of the guarantee if:

1. The average of the three outlet performance tests conducted shows that the emissions are reduced by 99%, exclusive of methane or are reduced to less than 10-ppm (as VOC), and,
2. Buyer does not conduct the performance test within the time frames described above.

If the equipment, when tested, does not meet the terms of the performance guarantee as specified herein, Seller shall have a maximum of 6 months to make whatever modifications and improvements that are necessary to meet the performance guarantee.

After such time that Seller has made such modifications and improvements, a second series of tests shall be performed to determine if the equipment is within the terms of the guarantee. Seller shall pay for this second series of tests.

If, after this second series of tests, the equipment still fails to meet the terms of the performance guarantee as specified above then Seller and Buyer shall agree on adjustments to the selling price or on a course of action including necessary additional improvements, which are fair and proper.

**Carbon Monoxide (CO):**

The seller guarantees that CO emissions from the proposed system will not exceed 100 PPMv with an RTO combustion chamber temperature a set point of 1600°F – 1,700°F.

**NOx:**

The seller guarantees that NOx emissions from the proposed system will not exceed .04lbs/mmBtu of natural gas consumption by rto system in addition to the NOx concentration at the inlet or chemical NOx formed from nitrogen bearing compounds.

**Warranty**

Seller warrants that the equipment offered in this proposal shall be free of defects in materials and workmanship for a period of twelve months from start-up or 18 months after delivery of equipment.

If any part of the equipment supplied is found to have a defect in material or workmanship, Seller will replace said part at no cost to Buyer.

This warranty does not apply to equipment failure due to normal wear and tear, abrasion, corrosion or negligence in operating the equipment on the part of Buyer or Buyer's sub-contractor(s).

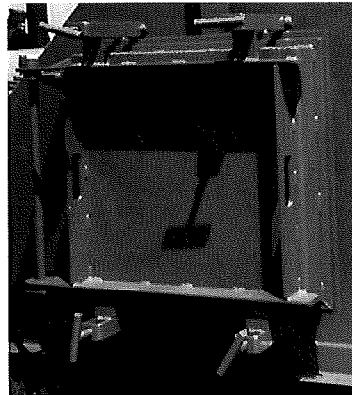
## **8.0 RTO EQUIPMENT DESCRIPTION (2-CHAMBER DESIGN)**

### **8.1 OXIDATION CHAMBER**

One (1) oxidation chambers will be provided. The oxidation chamber will be comprised of two (2) sections; one above each recovery chamber.

The oxidation chamber will be fabricated from a minimum 1/4" carbon steel plate with structural reinforced stainless steel flanges and mild steel stiffeners. The section's flange connection will be bolted and gasketed in the field during installation to assure tight sealing construction. Each oxidation chamber will be approximately 8'-0" wide x 18'-0" long x 6'-0" high and internally insulated with Thermal Ceramics, or equal, insulation. Also included is a mastic lining to provide a vapor barrier and protection against condensed acidic compounds.

The oxidation chamber will be provided with a hinged access door at the burner deck for routine inspection of the burner and internal insulation.



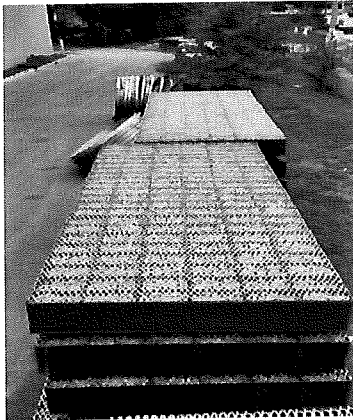
### **8.2 HEAT RECOVERY CHAMBER**

Seller will provide two (2) chambers approximately 8'-0" wide x 8'-0" long x 6'-0" high each. The vessels will be internally insulated with Thermal Ceramics, or equal, insulation. Also included is a mastic lining to provide a vapor barrier and protection against condensed acidic compounds

The regenerative heat recovery chamber will be fabricated from a minimum 1/4" Mild steel plate with structural reinforced stainless steel flanges and mild steel stiffeners (similar in design to the oxidation chamber).

The recovery chamber sections will be installed on the Seller's supplied structural support steel and bolted and gasketed to the oxidation chamber to assure tight seal construction.

The recovery chamber also includes mild steel grid structural trays with a 304L stainless steel perforated plate, designed to support the heat recovery media. The support grid is designed for a maximum operating temperature of 900°F.



*Media Support Grids*

### **8.3 INLET/OUTLET TRANSITION**

Two (2) inlet/outlet transitions will be provided. The inlet/outlet transitions are located directly below the heat recovery chambers. The transition section will be fabricated from 304L Stainless steel.

The transition section is designed to allow uniform air distribution to the bottom of the recovery chamber beds. The oxidizer housing is shop assembled and match marked to the maximum extent possible minimizing field installation time.

### **8.4 HEAT RECOVERY MEDIA**

The regenerative heat recovery chambers will be filled with 40-cell ceramic monolith. The ceramic elements are chemically and thermally stable for rapid heat up or cool down of the system. The unit will be supplied with adequate bed depth to provide 95% thermal energy recovery.

### **8.5 INTERNAL INSULATION**

One (1) lot of internal thermal insulation will be provided. The recovery and oxidation chamber will be internally insulated with Thermal Ceramics, or equal, insulation. Each module is a soft ceramic blanket fiber with 304 stainless steel reinforcement and mounting hardware. All internal insulation is shop installed and inspected prior to shipment. The ceramic insulation is 6" thick, 8# density in the recovery chamber and 6" thick, 10# density in the combustion chamber. The insulation is capable of operating at 2,400°F.

The internal insulation is designed to provide a 150°F skin temperature while operating at 1,500°F. (Skin temperature is based on 5-mph wind velocity and 70°F ambient temperature.)

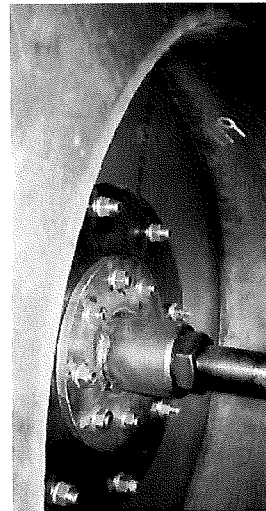
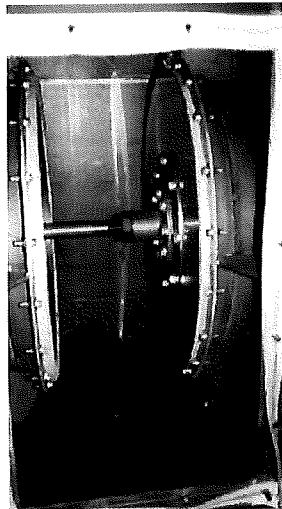
### **8.6 INLET AND OUTLET MANIFOLD**

Process air will be supplied to and from the oxidizer through the inlet and outlet manifolds. The inlet and outlet manifold system will be fabricated from a minimum 12 gage 304L Stainless steel, companion angle all weld construction. The manifold system will be structurally reinforced for temperature and pressure requirements.

### **8.7 PROCESS AIR FLOW CONTROL VALVES**

The oxidizer utilizes one (1) vertical blade type, dual seat flow control valve located under each of the heat recovery chamber to control the direction of flow of the process air into and out of the oxidizer. The valves include pneumatic actuators that are controlled by the Allen-Bradley PLC. The valves cycle the airflow, alternating the airflow direction through the oxidizer to maintain optimum heat recovery effectiveness during normal operation.

The valve disc seats and housing are fabricated from 304L stainless steel, the valve shaft is fabricated from 304L stainless steel. The valve components are precision machined and assembled prior to shipment. Each valve will include a Parker-Hannifin or equal, pneumatic actuator with mufflers and integral limit/position switch provides a control signal to the Allen-Bradley PLC.



### **8.8 EXHAUST STACK**

The outlet manifold will be connected to the main exhaust stack. The stack will be 34" in diameter by 35'-0" tall.

The stack is a freestanding design and is provided with an access platform. Two (2) EPA sampling ports positioned at 90 degrees to each other.

The stack will be fabricated from 304L stainless steel.

### **8.9 INDUCED DRAFT FAN**

The oxidizer will be supplied with an induced draft fan, direct drive, arrangement 8, designed and manufactured by Robinson, or equal. The fan will be supplied with a gear coupling, lubricated bearings, bolted inlet and outlet flanges, bolted and gasketed access



doors, drains and OSHA coupling guards. The fan will be fabricated from 304L stainless steel housing with a 316 stainless steel wheel and 304 stainless steel shaft.

See section 6.0 for operating horsepower and power usage.

The fans will be driven by a 125 hp, TEFC, industrial duty electric motor designed for 460 volt, 3 phase, 60 hertz.

#### **8.10 VARIABLE FREQUENCY DRIVE**

The process flow will be controlled by an Allen-Bradley, or equal, variable frequency drive system. The VFD will be supplied in a NEMA 1 enclosure for indoor installation.

The VFD controls the fan speed to maintain a preset inlet pressure to the fan. As process conditions change the Setra, or equal, pressure sensor located upstream of the fan senses any change in inlet pressure and signals the drive system to adjust fan speed and maintain set point.

#### **8.11 DILUTION AIR AND ISOLATION DAMPER**

The inlet ductwork will be connected to a Seller supplied dilution air damper that will be used during oxidizer operation to introduce fresh air into the oxidizer inlet during the required start-up, shut down purging, process upset conditions, and periodic idle mode operation. The valve is activated by an electric motor actuator, Bernard or equal, to an open/close position based on a signal from the Allen-Bradley PLC.

Also supplied is an inlet isolation damper located upstream of the RTO. The damper will be used during shutdown and periodic bake-outs to isolate the RTO unit from the system ductwork and process. The isolation valve and dilution valve will be fabricated from 304L stainless steel.

#### **8.12 MAIN CONTROL PANEL**

A wall mounted NEMA 4 control cabinet is included and mounted to the structural steel base grid. The panel is suitable for indoor or outdoor, non-hazardous locations.

All wiring is identified at both ends with designations corresponding to the diagrammatic wiring drawings. All wiring will be stranded copper with 600-volt insulation type MTW, THHN, or THWN. Minimum wire size will be #14 AWG.

#### **Externally Mounted Panel Components:**

- Selector switch for various modes of operation – Normal or Idle
- Emergency Stop Pushbutton with Mushroom Head Operator
- System reset switch
- Audible alarm
- Three (3) channel Honeywell or equal chart recorder
- Honeywell UDC2000 High Limit w' manual reset for hardwiring of: Chamber and bake out exhaust temperatures

- Allen-Bradley PanelView 1000 Color LCD function “keypad” MMI (Man Machine Interface) with real time process data. The following interface screens are provided:
  - ✓ **Main Start**
  - ✓ **System Status**
  - ✓ **Poppet Valves**
  - ✓ **Burner Control**
  - ✓ **Burner PID loop**
  - ✓ **RTO Fan PID loop**
  - ✓ **RTO Overview**
  - ✓ **System Set points**

**Internally Mounted Panel Components:**

- Allen-Bradley PLC SLC 500 Series with 5/05 processor and DH+ port
- Customer interlocks as required per intent of project
- Burner controller with Fireye Micro-M Flame Supervision Control with door mounted ultraviolet flame signal meter.
- 56K Allen Bradley compatible modem for remote system telemetry

**Outdoors Equipment Mounted Junction Box:**

The NESTEC, INC. outdoors junction box panel is designed to NEMA 4 specifications measuring approximately 36”x 48”x 12”. Junction box manufactured with a single outdoor receptacle (GFCI type supplied). All field instruments are provided to safely and efficiently monitor the controls of the thermal oxidizer system. This includes local gauges, thermocouples, control valves and differential pressure transmitters.

- Emergency Stop Pushbutton with Mushroom Head Operator
- Compressed air flow control valve with solenoids and pressure regulator
- Compressed air low pressure switch
- Proof of airflow for main system and combustion fans

### **8.13 SYSTEM COMPONENTS**

In addition to the main control panel, Seller will supply all necessary field components to ensure a safe and reliable system. Additional components include:

- Compressed air accumulator tank, pressure gauge and relief valve
- All field Type “K” thermocouples (8 total)
- Ultraviolet (UV) flame scanner for monitoring of burner operation
- All burner safety components supplied with IRI/FM approvable Maxon gas train utilizing Maxon Micro-Ratio Valve technology for reduced levels of CO and NO<sub>x</sub>.
- All field thermocouples for burner control and high temperature stack warning
- Local gauges provided to monitor the following locations:
  - ✓ Natural gas inlet pressure
  - ✓ Natural gas operating pressure
  - ✓ Compressed air pressure

#### **8.14 BURNER AND FUEL TRAIN**

The seller will provide One (1) Maxon Kinedizer "Lo-NOx" burners, one (1) combustion air blowers and one (1) gas trains sized for the maximum design oxidizer volume is included for start-up and normal operation of the oxidizer. Operation of the burner and fuel train is controlled by a Fireye Flame Safety System and includes pilot control, IRI/FM UV flame scanner, electronic ignition system, flame safeguards and safety interlocks.

The burner is rated at 2.5 MM BTU/hr.

The oxidizer system will be supplied with an access platform and ladder for each burner, for maintenance and routine inspection of the combustion chamber.

#### **8.15 PAINT**

All mild steel will be primed and painted with one (1) coat of primer and one (1) coat of finish paint prior to shipment. All OEM equipment will retain their factory finish.

Stainless steel will not be painted.

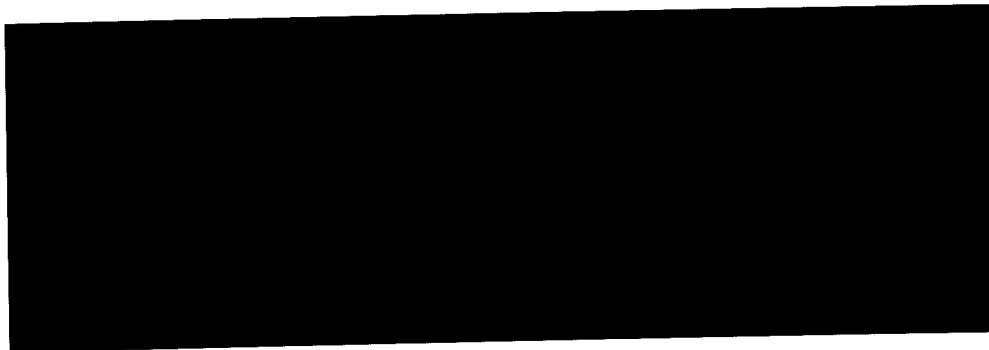
#### **8.16 TRAINING**

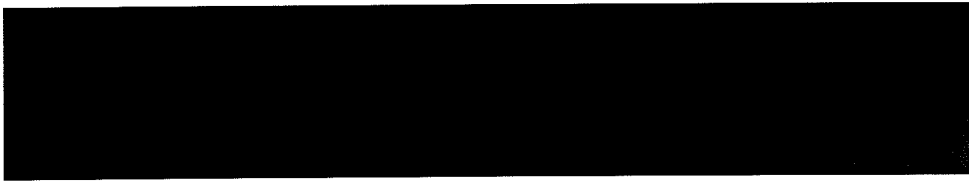
A complete training program is offered for all operation and maintenance personnel. They will be instructed in the operation of the unit as well as regular maintenance procedures. Trouble shooting guidelines will also be covered.

#### **8.17 TECHNICAL SERVICES**

Included in this offering is up to 10 days of on-site technical services. These services are for installation and system coordination. This includes pre-start-up check out, initial start-up assistance and system environmental testing set up. If additional time is required such as full time construction supervision by a NESTEC, INC. employed field engineer it can be purchased at the following rates:

All work and travel will be performed during normal working hours (Monday thru Friday) unless arranged otherwise in advance. Work and travel performed outside of normal hours, during weekends or holidays, will be subject to a premium rate. NESTEC, Inc. rates are stated below and will apply to all NESTEC, Inc. personnel involved in the scope of work described herein (service technician, installation supervision, engineering or project management support as required, etc.).





NESTEC, Inc. pricing is exclusive of any applicable taxes, duties, permits or fees associated with the work described herein.

#### **8.18 OPERATION AND MAINTENANCE MANUALS**

One (1) hard copy and two (2) electronic sets of operation and maintenance manuals will be provided.

#### **8.19 MECHANICAL INSTALLATION (OPTIONAL)**

Seller offers a complete mechanical installation of all of the items listed above.

Installation shall include the following services:

- Offloading and setting of oxidizer equipment including the recovery and combustion chambers, poppet valves, manifolds, exhaust stack, structural support steel, interconnecting ductwork and external insulation.
- Install all ancillary items for the required mechanical connections, i.e., expansion joints, access platforms, etc.
- Setting of burner and gas train and connecting to main, buyer supplied, gas line adjacent to the oxidizer foundation.
- Connecting to, buyer supplied, compressed air line for pneumatic controls, and running of all interconnecting compressed air piping.

#### **8.20 ELECTRICAL INSTALLATION (OPTIONAL)**

Seller offers a complete electrical installation from the main control panel to all field devices. This includes:

- Installation of all conduit and wire
- All electrical connections from the main control panel to exhaust fan, combustion blower, instrumentation and field control devices.

Electrical installation pricing is based on a total of 100 linear feet from the RTO unit to the main control panel.

#### **8.21 NOTES PERTAINING TO SCOPE**

##### **Engineering:**

All dimensions outlined in this proposal are approximate and subject to final engineering.

##### **Future Design Changes:**

In the interest of maintaining state-of-the-art reliability and performance in our equipment, Seller reserves the right to revise or make design changes to system

components and software to allow adoption of the latest advancements and developments in design from both our in-house engineering group and outside vendors.

**Safety Controls:**

All safety controls incorporated into our system are generally approved by insurance standards. Any additional safety controls required due to local codes or regulations shall be paid for by the Buyer.

**Sound Abatement:**

Noise levels from our system can only be estimated. If noise levels from the Oxidizer system or a combination of noise levels with other existing equipment exceed local code requirements, the Seller can provide additional sound abatement equipment at an additional cost.

## 9.0 TERMS AND CONDITIONS

Term of Proposal. Unless otherwise provided, this Proposal is subject to acceptance by Buyer within sixty (60) days from the Proposal date.

2. Proprietary & Confidential Materials. A. All drawings, patterns, specifications and information included in Seller's Proposal or Contract, and all other information otherwise supplied by Seller as to design, manufacture, erection, operation and maintenance of the equipment, shall be the proprietary and confidential property of Seller and shall be returned to Seller at its request. Buyer shall have no rights in Seller's proprietary and confidential property and shall not disclose such proprietary and confidential property to others or allow others to use such property, except as required for the Buyer to obtain service, maintenance, and installation for the equipment purchased from the Seller. Specifically, Buyer agrees that no drawings, specifications or information included in Seller's Proposal or Contract shall be used by Buyer for competitive bidding or similar purposes without Seller's consent and Buyer shall not reproduce or build assemblies or process systems per Seller's design drawings without explicit approval by Seller. B. Buyer shall hold in confidence and shall not disclose, divulge, or publish to any person, or use or copy any trade secret, process, record, plan, projection, information pertaining to customers or prospective customers, financial information, marketing strategies, or any other confidential or proprietary information of Seller (including the terms and conditions of this Contract or any other agreement between Buyer or Seller) acquired or in connection herewith, or disclosed or transmitted by Seller or any of its agents, employees, or affiliates, except as authorized in writing by Seller, and Buyer shall keep, and shall require its officers, directors, employees, and agents to keep such information confidential. C. This clause shall survive the termination of this Contract and be in effect as long as Buyer has possession of any of Seller's proprietary or confidential information.
3. Taxes, Permits, Licenses and Bonds. Unless otherwise provided, any tax or import duty imposed by any federal, state, local or municipal Authority arising out of either the sale, manufacture or installation of the equipment or performance covered by this Contract, is not included in the price as quoted in the Proposal, and will be made an additional charge to be paid by Buyer. All building, erection or other licenses or permits necessary or related to the work, shall be secured and paid for by the Buyer; and should the Seller be required to furnish any bond or bonds on account of the execution or fulfillment of this Contract, the cost shall be added to the quoted price.
4. Delivery. Unless otherwise provided, all shipments of materials and equipment shall be made Seller F.O.B. destination. Title and risk of damage to or loss of goods shall pass to Buyer upon delivery by Seller to the carrier. Seller assumes no responsibility for loss or damage to the equipment or machinery after delivery to carrier. No claim will be allowed unless made by Buyer within 7 days from receipt of shipment. This Contract is based on current freight rates and the price is subject to adjustment in the event that a change in such rates affects Seller's cost of performance hereunder. Prices quoted are for furnishing and shipping complete, or in accordance with the delivery schedule specified, the quality or quantities listed for each item. Should shipping releases or schedules be changed for any reason beyond Seller's control, Seller reserves the right to invoice according to quantities or equipment shipped. If Buyer declines or is unable to take delivery at the time(s) specified in the proposal or contract, Seller will have the equipment stored for Buyer at Buyer's risk and account, and the materials shall be considered "shipped." Buyer shall pay storage, handling and re-handling charges and continue to make payments according to the payment terms contained herein.
5. Price Adjustment. All shipping dates are approximate, based on prompt receipt by Seller of all necessary information and are subject to change by reason of conditions beyond Seller's reasonable control as stated in Article 17. Should Buyer request delay in shipment of the equipment, or after shipment the installation thereof is delayed by Buyer or for any cause beyond Seller's reasonable control, the entire purchase price, less the amount estimated for installation, or any incomplete part thereof or the price of any other incomplete work, shall be due and payable within 30 days after shipment, or if not shipped, 30 days from the date the equipment is ready for shipment. In the event Buyer requires Seller to delay engineering, fabrication, shipment, installation, or start-up of the equipment and/or machinery under this Contract, Seller shall be entitled to full reimbursement for all costs incurred as a result of such delay.
6. Installation. In the event installation work is a part of this Contract, the equipment and/or machinery shall be assembled, erected and installed under the personal direction of an employee or the agent of the Seller. Buyer shall furnish sufficient electricity, water, air, light, heat, sanitary facilities, and fire protection as well as adequate all-weather storage space, ingress and egress to job site and other items that may be listed under Buyer's responsibilities. The site is to be prepared for installation personnel to work in a normal fashion with no extra equipment or procedures required due to construction or production interferences. Unless otherwise stated, installation shall be performed only during Seller's normal working hours and any overtime work required for any reason shall be requested by and paid for by Buyer.
7. Changes and Differing Conditions. A. In the event there are changes requested by Buyer, or changes in site conditions or installation requirements subsequent to issuance of the Purchase Order, the parties shall renegotiate the price quoted herein to reflect all expenses caused by said changes. B. Buyer, by written order accepted by Seller, may make reasonable changes in the scope of work subject to equitable adjustments in the Contract price and schedule, including an allowance for increased overhead and profit. Seller is not obligated to incur any expense or do any work in excess of that reasonably anticipated unless Buyer issues a written order for such expense and work with mutually acceptable terms and conditions. C. Seller reserves the right to make changes, subject to Buyer's approval, in design or material which in Seller's judgment are for improvement in the equipment and/or its operation. D. In the event Seller is installing equipment and any site conditions or installation requirements at the time of erection differ materially from those evident at the time of Seller's pre-bid site visit, Buyer's representations, and conditions ordinary to similar projects, then any additional costs caused by the differing site conditions or installation requirements shall be subject to equitable adjustment to the Contract price and schedule. E. In the event activities or operations at the site by parties other than Seller interfere with the execution of the work, an equitable adjustment shall be made to the Contract price and schedule.
8. Safety Devices. Seller will supply such safety devices or fire protection equipment as is specified in the Proposal. If Buyer desires or requires through local, state, or insurance underwriter's specifications or regulations, other additional safety devices or equipment, Seller will undertake, without being obligated therefore, to furnish same at Buyer's cost.
9. Material/Workmanship Warranty. Seller warrants that all equipment and machinery which it manufactures and furnishes and work provided will be free from defects in materials and workmanship for a period of twelve (12) months after the first item is shipped. Seller's sole obligation hereunder is to repair or replace, at Seller's option, any part or component which, after Seller's inspection, proves to be defective. This warranty does not apply to consumable, replaceable parts or components normally subject to wear and replacement.  
*Seller's obligations hereunder are subject to the following conditions:*
  - a) Receipt from Buyer of immediate written notice of any defect containing a full description thereof.
  - b) Buyer shall not without Seller's approval have attempted to correct the defect.
  - c) Buyer shall have installed (if applicable), operated and maintained the equipment strictly in accordance with Seller's operating and maintenance instructions, including, but not limited to, the use of only those materials specified in the Proposal and in the inlet quantities stated in the Proposal.
  - d) The defect has been caused solely by faulty materials or workmanship for which Seller is responsible, and is not due to such things as erosion, corrosion, or deterioration resulting from the manner in which the equipment is operated, accident (including damage during shipment), neglect, misuse or abuse, or exposure to conditions beyond the environmental power or operating constraints specified by Seller.

To the extent that the materials and equipment furnished consist of products manufactured by other parties, such manufacturer's warranty is hereby assigned to Buyer, and Seller's responsibility with respect to any such products shall not extend beyond the manufacturer's warranty with respect thereto. It is understood that Seller's warranty with respect to such products is limited to repair or replacement at Seller's option and does not include labor, costs to repair or replace components or travel unless specifically provided otherwise.

10. Patent Warranty. Seller shall defend at its expense any suit or proceeding brought against Buyer based on any claim that the equipment covered herein, except for equipment or material manufactured or designed to Buyer's specifications, infringes any U.S. patent issued as of the date of this Proposal, and pay any court imposed damages and costs finally awarded against Buyer, but not to exceed the amount theretofore paid to Seller by Buyer hereunder provided: a) Seller is promptly notified by Buyer in writing of such claim; and b) Seller is given full authority, information, & assistance by Buyer which Seller deems necessary for the tests (if applicable) in accordance w/applicable standard procedures as specified in the proposal & in conduct of such defense.  
*Seller shall have the right and option at any time in order to avoid such claims or actions and minimize potential liability to: a) procure for the Buyer the right to use the equipment; or b) modify the equipment so that it no longer infringes; or c) replace the equipment with non-infringing equipment.*
11. Performance Guarantee. Seller's sole guarantees are those contained in its Proposal to Buyer. These guarantees are contingent upon the correctness & accuracy of the information provided by Buyer & are based upon the operating conditions specified in Seller's Proposal & operation & maintenance by properly trained personnel. These guarantees will be deemed satisfied by successful completion of performance effect on the date of this proposal. Performance tests shall be conducted by the Buyer, (unless otherwise specified in Seller's proposal), & witnessed by Seller, at its option, w/in ninety (90) days of initial operation of the equipment. In the event the said tests are not conducted within ninety (90) days of initial operation or within six (6) months of shipment, whichever is earlier, & through no fault of Seller, the equipment shall be deemed accepted by the Buyer and in compliance with all contractual requirements. Seller makes no warranty whatsoever as to the inclusion of the equipment supplied by Seller into Buyer's process (if applicable), Seller's warranty being limited solely to the performance of its equipment in accordance w/the specifications therefore. In the event the equipment fails to meet the Contract performance guarantees, Seller will supply at its sole option, repaired or replacement parts pursuant to the delivery terms of the Proposal subject to the limitations stated in Article 15.
12. IMPLIED WARRANTIES/GUARANTIES DISCLAIMER. THE WARRANTIES AND GUARANTIES FURNISHED BY SELLER, AS EXPRESSLY INCLUDED HEREIN, CONSTITUTE THE SELLER'S SOLE OBLIGATION HEREUNDER AND ARE IN LIEU OF ANY OTHER WARRANTIES OR GUARANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
13. Disclaimer of Consequential Damages. Seller, its subsidiaries, affiliates, agents, or employees shall not be liable to Buyer for incidental, indirect, special, liquidated or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of equipment, costs of replacement or substitute goods or product, costs of capital, additional expenses incurred in the use of equipment or facilities, or claims of third parties. This disclaimer shall apply to consequential damages based upon any cause of action whatsoever asserted against Seller, including one arising out of any breach of warranty, express or implied; guarantee; products liability, negligence; tort; or any other theory of liability.
14. Indemnification by Buyer. Buyer shall indemnify Seller for, & hold Seller harm-less from, all costs & expenses incurred by Seller, including, without limitation, costs of investigation, attorney's fees, & amounts paid in settlement or satisfaction of claims, proceedings, or judgments, in connection w/all claims & proceedings against Seller based upon claimed defects in design in any equipment or material manufactured for Buyer by Seller to Buyer's specifications or design.
15. Limitation of Liability. In no event will Seller's liability to the Buyer for any and all claims, including property damage and personal injury claims, allegedly resulting from breach of contract, tort, or any other theory of liability exceed the amount of the initial purchase price paid to Seller by Buyer.
16. Buyer's Negligence and Insurance. Seller shall not be responsible for losses or damages arising out of the negligence of the Buyer, its employees, agents or architects or those of third parties whom Seller is not responsible, or losses for which the Buyer has agreed to provide insurance. In the event that both Seller and the Buyer are negligent and the negligence of both is approximate cause of the accident, then in such event each party will be responsible for its portion of the liability or damages (excluding consequential or indirect damages which are disclaimed by Seller) resulting there from equal to such party's comparative share of the total negligence.
17. Delays and Damages - Force Majeure. A. In the event of delays in the performance of the obligations hereunder or damages due to conditions beyond Seller's reasonable control, including, but not limited to acts of God, acts of Buyer, or Buyer's customer or of other contractors employed by Buyer, acts of civil or military authority, governmental restrictions, prohibitions and regulations, priorities, fire, storms, strikes, floods, epidemics, quarantine restrictions, war, riot, delays in transportation, car shortages, or Buyer's inability to obtain necessary labor, materials, or manufacturing facilities, the Contract dates shall be extended by an equitable period of time and Seller shall be entitled to an equitable adjustment in the Contract price. B. Acceptance of the equipment by Buyer shall constitute a waiver of all claims for damages. C. Seller's shipping dates are approximate. Seller will not be responsible for loss or damage arising from delays caused by lack of correct or complete dates from Buyer. D. This Section shall in no event be construed to relieve Buyer from the obligation to pay for goods shipped by Seller.
18. Cancellations. In the event of any cancellation by Buyer for any reason at any time after Seller has received a purchase order (or other authorization) for any equipment, parts, or services or any combination thereof, Buyer shall pay to Seller within 30 days of such cancellation, all contract costs and other expenses incurred by Seller prior to receipt of the request for cancellation (including, but not limited to, engineering expenses, and overhead, costs of expended material, direct labor with factory burden, and all commitments to Seller's suppliers, subcontractors and others), plus cancellation charges of 20% of the Contract price to cover general and administrative expenses plus 10% of the Contract price to cover profit lost by reason of cancellation.
19. OSHA - Federal, State, & Local. Seller agrees to comply with the Federal OSHA requirements in effect as of the date of this proposal relative to the work performed hereunder. Seller's sole responsibility is limited to modification or replacement of the equipment cited as violating such standards. OSHA requirements with respect to noise are specifically excluded. Where state, local or Buyer's health & safety requirements differ from the Federal OSHA requirements, modifications or changes in design to meet such requirements will be incorporated at Buyer's request. Additional costs arising from such requests & from erection procedures required by state, local or Buyer's health & safety regulations which deviate from Federal OSHA requirements will be for Buyers' acct.
20. Hazardous Materials. If the Buyer's facilities contain hazardous materials, including asbestos bearing materials and any such materials are encountered, Seller shall have no obligation to remove or remediate them in the absence of a separate agreement that includes separate consideration to Seller for such work. If Seller or any of its subcontractors is required to perform work within or immediately adjacent to any facilities that are determined to contain hazardous materials and/or asbestos, and the said work must be interrupted to allow for the remediation or removal of such materials by others, Seller shall be entitled to any and all costs & other expenses associated with such interruption in work. Buyer shall fully defend, hold harmless and indemnify Seller & its agents from & against any claim arising out of exposure to such hazardous &/or asbestos bearing materials.
21. Credit and Payment. A. Unless otherwise agreed, payment shall be as outlined in the Proposal and payments shall be made in current funds of the U.S. at par within 30 days of presentation of an invoice. Payments not received by the due date shall be subject to a monthly interest charge at the rate of 2% per month or the maximum amount allowed by law, whichever is less, due and payable until the payment is received. B. Buyer shall also pay all collection costs of Seller on any delinquent amounts including but not limited to court costs and attorney fees. In the event that Seller in its sole and absolute discretion, shall deem Buyer's financial condition to be unsatisfactory, Seller shall have the right to (a) limit the amount of credit that Seller may extend to Buyer for the purpose of goods hereunder, and delay manufacture or shipment of Buyer's orders based upon said limitations; (b) require full or partial payment in advance; (c) ship goods to Buyer C.O.D., or require payment to be secured by letters of credit; (d) require written guarantees of payment satisfactory to Seller; or (e) cancel or refuse to accept or fill any order from Buyer then outstanding or thereafter placed.  
21.1 Default in Payment. A. If any payment due Seller is more than 30 days past due, Seller shall have the right at its sole option to accelerate the payment of all outstanding amounts, including, but not limited to, amounts previously retained pursuant to the Contract, by notifying Buyer in writing that all outstanding amounts are immediately due and presenting Buyer with an invoice for said amount. Seller shall also have the right in such event to

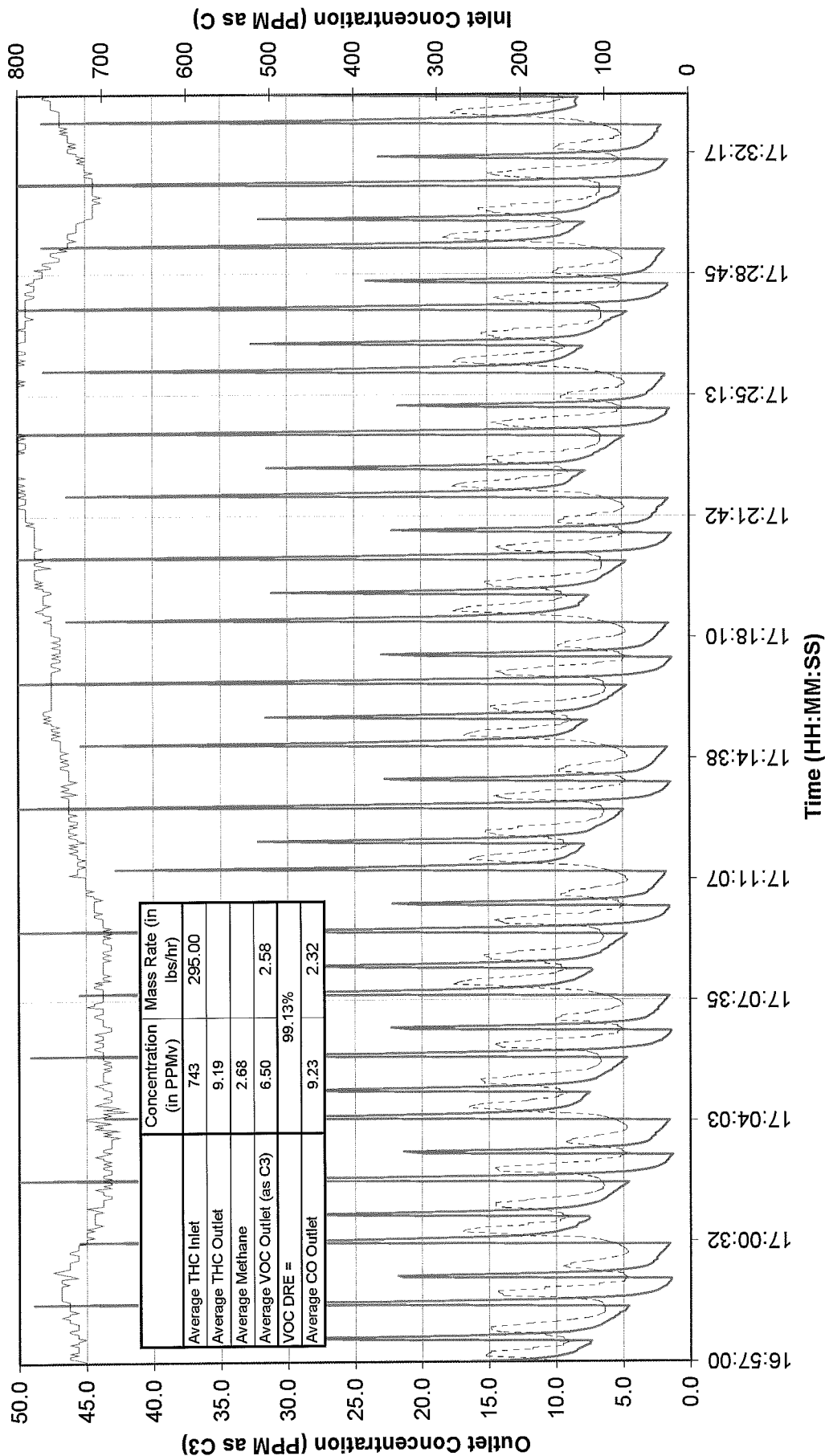
discontinue all work on the project without incurring any liability to Buyer for such action. B. In the event the total aggregate amount of delinquent payments exceeds at any point during the term of the agreement ten (10%) percent of the total contract amount, Buyer shall provide at Seller's request, additional collateral including but not limited to irrevocable letters of credit, sufficient to secure payment of all contract amounts. C. The foregoing remedies of Seller are in addition to all other remedies Seller may have at law or in equity, including but not limited to the right to obtain liens on Buyer's assets through legal or equitable proceedings.

- 21.2 Security Agreements. A. Buyer hereby grants to Seller a security interest in the equipment or materials sold hereunder to secure the purchase price of same. Buyer shall execute any financing or other statements or filings which in Seller's sole judgment are necessary or appropriate to evidence or perfect such security interest, which shall thereafter be filed by Buyer with the appropriate recording officer. This Contract shall constitute the security agreement between the parties and is intended to and shall afford the Seller all rights of a secured party under Article 9 of the Uniform Commercial Code. B. Until Buyer has paid the full amount due and owing for any equipment or materials purchased hereunder, Buyer shall be prohibited from transferring such equipment or materials to any creditor of Buyer other than Seller, unless Seller provides its prior written consent to such transfer, such consent not to be unreasonably withheld. C. In the event Buyer becomes insolvent, files for bankruptcy, or goes into receivership or liquidation, Buyer agrees to use its best efforts and to provide all assistance requested by Seller in order to secure Seller's position as a preferred creditor with respect to all amounts due to Seller.
- 21.3 Payment of Retained Amounts. A. If this Contract permits Buyer to withhold final payment, and acceptance is not based upon performance tests, such final payments shall be due and payable within 30 days after the equipment is ready for operation. B. If such deferred payment is contingent upon tests and such tests are delayed through no fault of Seller for more than 30 days after the equipment is first ready for operation, final payment shall be due and payable upon expiration of such 30-day period.
22. Other Contractors. Seller shall not have any duty or authority to direct, supervise or oversee any contractors of Buyer of their work or to provide the means, methods or sequence of their work or to stop their work. Seller's services and/or presence at a site shall not relieve others of their responsibility to Buyer or to others. Seller shall not be liable for the failure of Buyer's contractors or others to fulfill their responsibilities, and Buyer agrees to indemnify, hold harmless and defend Seller against any claims arising out of such failures.
23. Escalation. Seller and Buyer will agree on a fair and equitable escalation arrangement to compensate for uncontrollable inflation factors in the event the Contract exceeds the time frame contemplated by the parties.
24. Assignment/Subcontracts. This Contract shall be binding upon and inure to the benefit of the parties, their successors, and assigns provided that Buyer may not assign the Contract without prior written consent of Seller. Seller may subcontract any portion of the work.
25. Disputes. In the event of a dispute arising hereunder, the parties will confer & attempt to amicably resolve the dispute. If after good faith negotiation, the parties cannot reach agreement, then the matter will be finally resolved in any court having jurisdiction.
26. Contract Interpretation. If any of the provisions of these General Terms and Conditions of Sale (including statements made in the Proposal) conflict with any provisions in Buyer's documents, the former shall govern unless Seller expressly agrees to the contrary in writing. Any contract resulting from this Proposal shall be construed in accordance with the laws of the State of Florida. All communications written and verbal, between the parties hereto with reference to the subject of this Proposal prior to the date of its acceptance are merged herein, and this Proposal, when duly accepted and approved, shall constitute the sole and entire agreement and Contract between the parties as to the subject matter thereof. No change in or modifications of said Contract shall be binding upon the parties or either of them, unless the changes or modifications shall be duly accepted in writing by the Buyer and approved in writing by Seller.
27. Severability. Should any part of this Contract be declared invalid or unenforceable, such decision shall not invalidate the remaining provisions of this Contract.



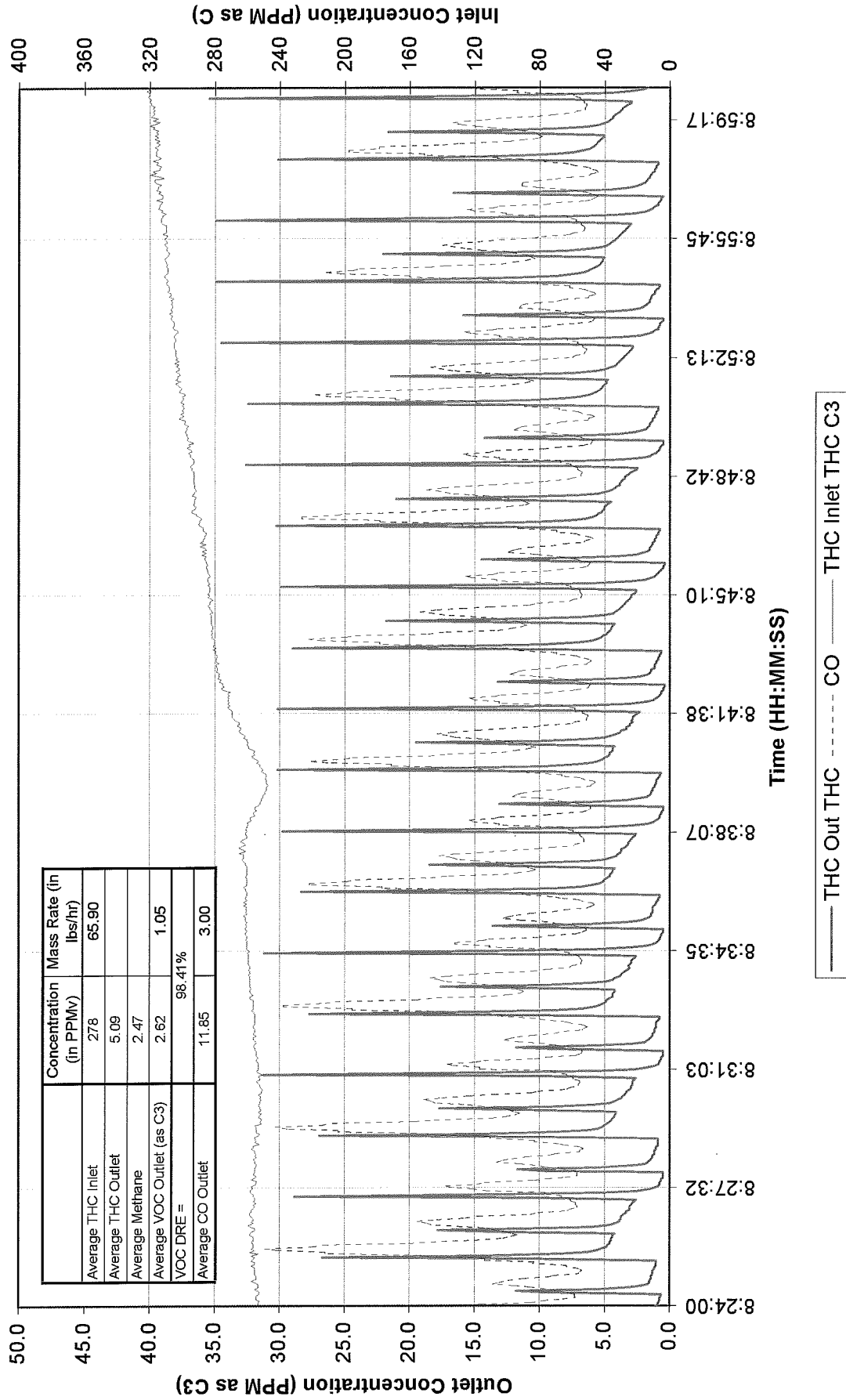
## **10.0   EQUIPMENT DRAWINGS**

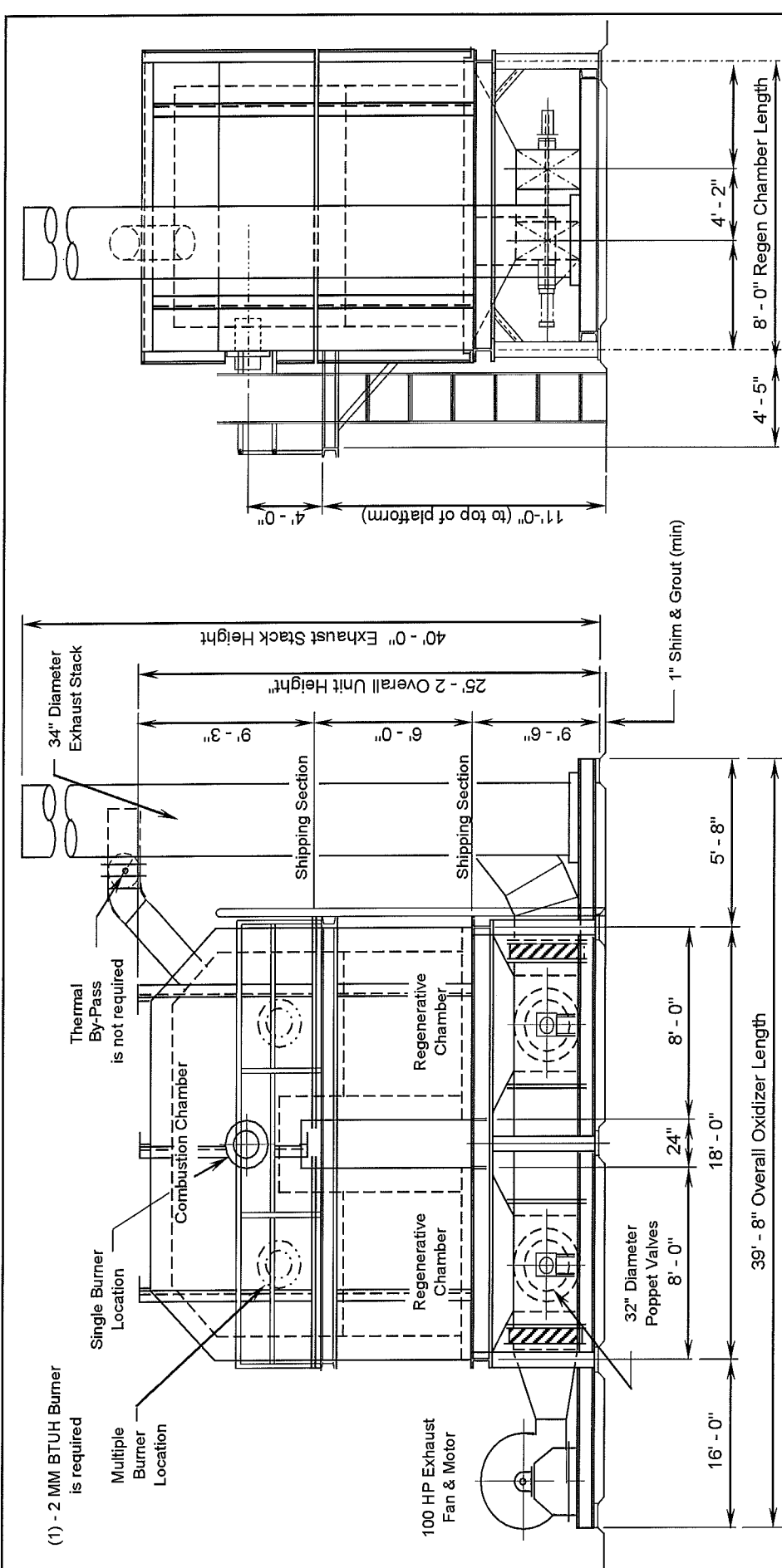
# RTO Test Run 4 1550F - 11/2/05



— THC Out - - - - CO Out — THC Inlet

# RTO Test Run 5 1550F - 11/3/05





FRONT ELEVATION VIEW

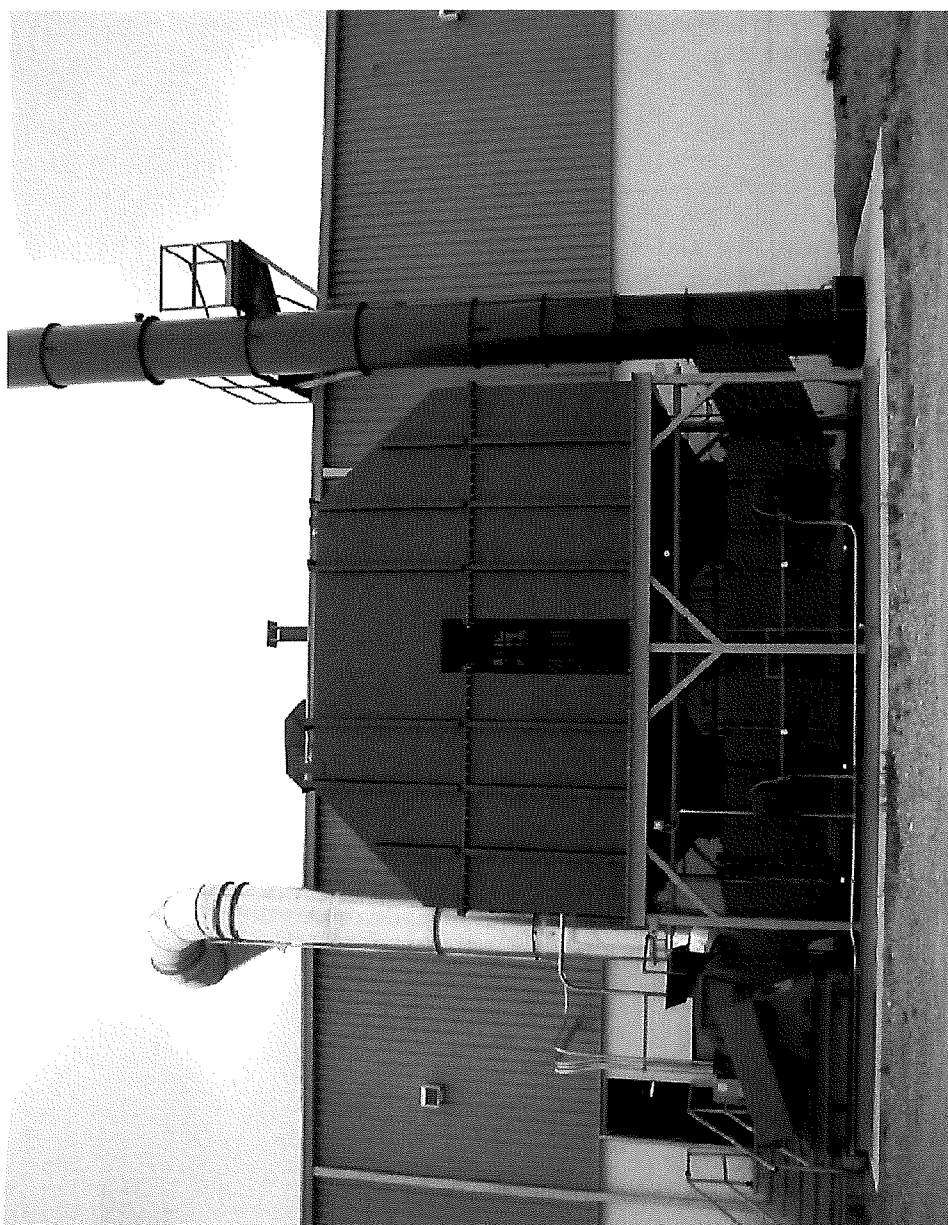
END ELEVATION VIEW

Delta-T, Burley, ID	Project No. XXX-01
November 1, 2006	
NESTEC Inc	
1601 Moyer Road	
Telford, PA (215) 234-8188	
13,249 SCFM, (2) Chamber Regenerative Thermal Oxidizer	
Type 1 GENERAL ARRANGEMENT	
98% Destruction Efficiency	
95% Thermal Efficiency	
Drawing No.	XXX-01 - 0001 - 0

Note: This is only a proposal drawing. All dimensions are approximate, and subject to final engineering.

Approximate Weight: 79,898 lbs



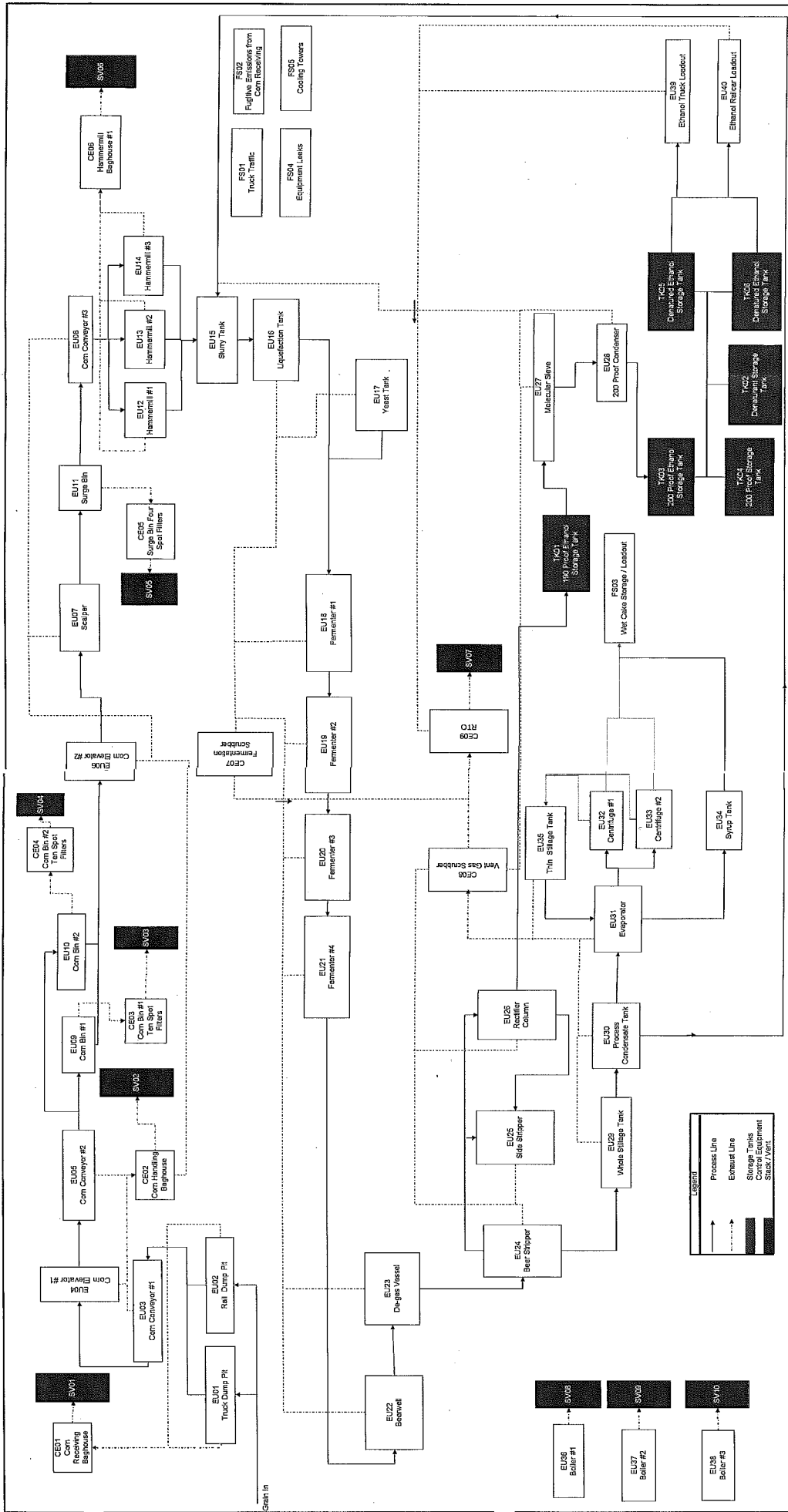


APPENDIX B  
SITE LAYOUT

APPENDIX C

PROCESS FLOW DIAGRAM





# Process Flow Diagram

Pacific Ethanol Burley, LLC  
Burley, Idaho



Pacific Ethanol, Inc.



DATE: 2/27/2006  
REVISED: 10/31/2006  
SCALE: NTS  
DRAWN BY: ALWERTZ

APPENDIX D  
TANKS 4.09 DATA

# TANKS 4.0

## Emissions Report - Detail Format

### Tank Identification and Physical Characteristics

#### Identification

User Identification: PAC - Burley- TK01  
City: Burley  
State: Idaho  
Company: Pacific Ethanol Burley, LLC  
Type of Tank: Internal Floating Roof Tank  
Description: Off-spec 190 Proof Tank

#### Tank Dimensions

Diameter (ft): 25.00  
Volume (gallons): 116,800.00  
Turnovers: 5.14  
Self Supp. Roof? (y/n): N  
No. of Columns: 1.00  
Eff. Col. Diam. (ft): 1.00

#### Paint Characteristics

Internal Shell Condition: Light Rust  
Shell Color/Shade: White/White  
Shell Condition: Good  
Roof Color/Shade: White/White  
Roof Condition: Good

#### Rim-Seal System

Primary Seal: Liquid-mounted  
Secondary Seal: None

#### Deck Characteristics

Deck Fitting Category: Detail  
Deck Type: Welded

#### Deck Fitting/Status

	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Pocatello, Idaho (Avg Atmospheric Pressure = 12.53 psia)

# **TANKS 4.0** **Emissions Report - Detail Format** **Liquid Contents of Storage Tank**

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Ethyl alcohol	All	48.21	41.93	54.49	48.37	0.4341	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

# TANKS 4.0

## Emissions Report - Detail Format

### Detail Calculations (AP-42)

Annual Emission Calculations	
Rim Seal Losses (lb):	16.2476
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1.75</sup> ):	0.3000
Value of Vapor Pressure Function:	0.0088
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4341
Tank Diameter (ft):	25.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Withdrawal Losses (lb):	5.5565
Number of Columns:	1.0000
Effective Column Diameter (ft):	1.0000
Annual Net Throughput (gal/yr):	600,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.6100
Tank Diameter (ft):	25.0000
Deck Fitting Losses (lb):	86.7624
Value of Vapor Pressure Function:	0.0088
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact (lb-mole/yr):	213.6000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor (ft/sqft):	0.0000
Tank Diameter (ft):	25.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000

Deck Fitting/Status	Quantity	KFa (lb-mole/yr)	Deck Fitting Loss Factors KFb (lb-mole/(yr mph <sup>1.75</sup> ))	m	Losses (lb.)
Access Hatch (24-in. Diam./Unbolted Cover, Gasketed	1	31.00	5.20	1.30	12.5919
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	1.7466
Column Well (24-in. Diam./Built-Up Col.-Sliding Cover, Gask.	1	33.00	0.00	0.00	13.4043
Ladder Well (36-in. Diam./Sliding Cover, Gasketed	9	56.00	0.00	0.00	22.7467
Roof Leg or Hanger Well/Adjustable	1	7.90	0.00	0.00	28.8802
Sample Pipe or Well (24-in. Diam./Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	4.8743
Vacuum Breaker (10-in. Diam./Weighted Mech. Actuation, Gask	1	6.20	1.20	0.94	2.5184
Total Losses (lb):					108.5685

# **TANKS 4.0** **Emissions Report - Detail Format** **Individual Tank Emission Totals**

## **Annual Emissions Report**

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Ethyl alcohol	16.25	5.56	86.76	0.00	108.57

# TANKS 4.0

## Emissions Report - Detail Format

### Tank Identification and Physical Characteristics

**Identification**  
 User Identification: PAC - Burley- TK02  
 City: Burley  
 State: Idaho  
 Company: Pacific Ethanol Burley, LLC  
 Type of Tank: Internal Floating Roof Tank  
 Description: Denaturant Storage Tank

**Tank Dimensions**  
 Diameter (ft): 20.42  
 Volume (gallons): 74,300.00  
 Turnovers: 40.38  
 Self Supp. Roof? (y/n): N  
 No. of Columns: 1.00  
 Eff. Col. Diam. (ft): 1.00

**Paint Characteristics**  
 Internal Shell Condition: Light Rust  
 Shell Color/Shade: White/White  
 Shell Condition: Good  
 Roof Color/Shade: White/White  
 Roof Condition: Good

**Rim-Seal System**  
 Primary Seal: Liquid-mounted  
 Secondary Seal: None

**Deck Characteristics**  
 Deck Fitting Category: Detail  
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Pocatello, Idaho (Avg Atmospheric Pressure = 12.53 psia)

# TANKS 4.0 Emissions Report - Detail Format Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)		Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.					
Gasoline (RVP-10)	All	48.21	41.93	54.49	46.37	4.1037	N/A	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3



TANKS 4.0  
Emissions Report - Detail Format  
Detail Calculations (AP-42)

Annual Emission Calculations	
Rim Seal Losses (lb):	213.2354
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1/2</sup> ):	0.3000
Value of Vapor Pressure Function:	0.0989
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.1037
Tank Diameter (ft):	20.4200
Vapor Molecular Weight (lb/lb-mole):	66.0000
Product Factor:	1.0000
Withdrawal Losses (lb):	29.0650
Number of Columns:	1.0000
Effective Column Diameter (ft):	1.0000
Annual Net Throughput (gal/yr.):	3,000,000.000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	5.6000
Tank Diameter (ft):	20.4200
Deck Fitting Losses (lb):	1,342.5108
Value of Vapor Pressure Function:	0.0989
Vapor Molecular Weight (lb/lb-mole):	66.0000
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact (lb-mole/yr):	205.7000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Tank Diameter (ft):	20.4200
Vapor Molecular Weight (lb/lb-mole):	66.0000
Product Factor:	1.0000

Deck Fitting/Status	Quantity	KF <sub>A</sub> (lb-mole/yr)	Deck Fitting Loss Factors		m	Losses (lb.)
			KF <sub>B</sub> (lb-mole/(yr mph <sup>1/2</sup> m))			
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1	31.00	5.20		1.30	202.3230
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00		0.38	28.0642
Column Well (24-in. Diam.)/Built-Up Col./Sliding Cover, Gask	1	33.00	0.00		0.00	215.3761
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00		0.00	365.4866
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00		0.00	412.4778
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00		0.00	78.3186
Vacuum Breaker (10-In. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20		0.94	40.4546
Total Losses (lb):						1,584.8112

**TANKS 4.0**  
**Emissions Report - Detail Format**  
**Individual Tank Emission Totals**

**Annual Emissions Report**

Components	Rim Seal Loss	Withdrawal Loss	Losses(lbs)		Deck Seam Loss	Total Emissions
			Deck Fitting Loss			
Gasoline (RVP 10)	213.24	29.07	1,342.51		0.00	1,584.81

# TANKS 4.0

## Emissions Report - Detail Format

### Tank Identification and Physical Characteristics

**Identification**  
 User Identification: PAC - Burley- TK03  
 City: Burley  
 State: Idaho  
 Company: Pacific Ethanol Burley, LLC  
 Type of Tank: Internal Floating Roof Tank  
 Description: 200 Proof Storage Tank

**Tank Dimensions**  
 Diameter (ft): 25.00  
 Volume (gallons): 116,800.00  
 Turnovers: 258.62  
 Self Supp. Roof? (y/n): N  
 No. of Columns: 1.00  
 Eff. Col. Diam. (ft): 1.00

**Paint Characteristics**  
 Internal Shell Condition: Light Rust  
 Shell Color/Shade: White/White  
 Shell Condition: Good  
 Roof Color/Shade: White/White  
 Roof Condition: Good

**Rim-Seal System**  
 Primary Seal: Liquid-mounted  
 Secondary Seal: None

**Deck Characteristics**  
 Deck Fitting Category: Detail  
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Silt Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Pocatello, Idaho (Avg Atmospheric Pressure = 12.53 psia)

# TANKS 4.0 Emissions Report - Detail Format Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Ethyl alcohol	All	48.21	41.93	54.49	46.37	0.4341	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

# TANKS 4.0

## Emissions Report - Detail Format

### Detail Calculations (AP-42)

<b>Annual Emission Calculations</b>		16.2476
Rim Seal Losses (lb):		1.6000
Seal Factor A (lb-mole/ft-yr):		0.3000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1/2</sup> ):		0.0088
Value of Vapor Pressure Function:		0.4341
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):		25.0000
Tank Diameter (ft):		46.0700
Vapor Molecular Weight (lb/lb-mole):		1.0000
Product Factor:		
Withdrawal Losses (lb):	277.8240	
Number of Columns:	1.0000	
Effective Column Diameter (ft):	1.0000	
Annual Net Throughput (gal/yr):	30,000,000.00	
	00	
Shell Clirrage Factor (bbl/1000 sqft):	0.0015	
Average Organic Liquid Density (lb/gal):	6.6100	
Tank Diameter (ft):	25.0000	
Deck Fitting Losses (lb):	86.7624	
Value of Vapor Pressure Function:	0.0088	
Vapor Molecular Weight (lb/lb-mole):	46.0700	
Product Factor:	1.0000	
Tot. Roof Fitting Loss Fact (lb-mole/yr):	213.6000	
Deck Seam Losses (lb):	0.0000	
Deck Seam Length (ft):	0.0000	
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	
Deck Seam Length Factor(ft/sqft):	0.0000	
Tank Diameter (ft):	25.0000	
Vapor Molecular Weight (lb/lb-mole):	46.0700	
Product Factor:	1.0000	

Deck Fitting/Status	Quantity	KFa (lb-mole/yr)	Deck Fitting Loss Factors		m	Losses (lb.)
			KFb (lb-mole/yr mpr/m)			
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1	31.00	5.20		1.30	12.5919
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00		0.38	1.7466
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1	33.00	0.00		0.00	13.4043
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00		0.00	22.7467
Roof Leg or Hanger Well/Adjustable	9	7.90	0.00		0.00	28.8802
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00		0.00	4.8743
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20		0.94	2.5184
Total Losses (lb):						380.8340

# **TANKS 4.0** **Emissions Report - Detail Format** **Individual Tank Emission Totals**

## **Annual Emissions Report**

Components	Rim Seal Loss	Withdrawal Loss	Losses(lbs)		Deck Seam Loss	Total Emissions
			Deck Fitting Loss			
Ethyl alcohol	16.25	277.82	86.76		0.00	380.83

# TANKS 4.0

## Emissions Report - Detail Format

### Tank Identification and Physical Characteristics

#### Identification

User Identification: PAC - Burley- TK04  
 City: Burley  
 State: Idaho  
 Company: Pacific Ethanol Burley, LLC  
 Type of Tank: Internal Floating Roof Tank  
 Description: 200 Proof Storage Tank

#### Tank Dimensions

Diameter (ft): 25.00  
 Volume (gallons): 116,800.00  
 Turnovers: 256.85  
 Self Supp. Roof? (y/n): N  
 No. of Columns: 1.00  
 Eff. Col. Diam. (ft): 1.00

#### Paint Characteristics

Internal Shell Condition: Light Rust  
 Shell Color/Shade: White/White  
 Shell Condition: Good  
 Roof Color/Shade: White/White  
 Roof Condition: Good

#### Rim-Seal System

Primary Seal: Liquid-mounted  
 Secondary Seal: None

#### Deck Characteristics

Deck Fitting Category: Detail  
 Deck Type: Welded

#### Deck Fitting/Status

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Pocatello, Idaho (Avg Atmospheric Pressure = 12.53 psia)

# TANKS 4.0 Emissions Report - Detail Format Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Ethyl alcohol	All	48.21	41.93	54.49	46.37	0.4341	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52



# TANKS 4.0

## Emissions Report - Detail Format

### Detail Calculations (AP-42)

Annual Emission Calculations	
Rim Seal Losses (lb):	16.2476
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1/2</sup> ):	0.3000
Value of Vapor Pressure Function:	0.0088
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4341
Tank Diameter (ft):	25.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Withdrawal Losses (lb):	277.8240
Number of Columns:	1.0000
Effective Column Diameter (ft):	1.0000
Annual Net Throughput (gal/yr):	30,000,000.00
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.6100
Tank Diameter (ft):	25.0000
Deck Fitting Losses (lb):	86.7624
Value of Vapor Pressure Function:	0.0088
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact (lb-mole/yr):	213.8000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor (ft/sqft):	0.0000
Tank Diameter (ft):	25.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000

Deck Fitting/Status	Quantity	KFa (lb-mole/yr)	Deck Fitting Loss Factors KFc (lb-mole/yr mpt <sup>1/2</sup> )	m	Losses (lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1	31.00	5.20	1.30	12.5919
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	1.7466
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask	1	33.00	0.00	0.00	13.4043
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	22.7467
Roof Leg or Hanger Well/Adjustable	9	7.90	0.00	0.00	28.8802
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	4.8743
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask	1	6.20	1.20	0.94	2.5164

Total Losses (lb): 380.8340

**TANKS 4.0**  
**Emissions Report - Detail Format**  
**Individual Tank Emission Totals**

**Annual Emissions Report**

Components	Rim Seal Loss	Withdrawal Loss	Losses(lbs)		Deck Seam Loss	Total Emissions
			Deck Fitting Loss			
Ethyl alcohol	16.25	277.82	86.76		0.00	380.83

# TANKS 4.0

## Emissions Report - Detail Format

### Tank Identification and Physical Characteristics

**Identification**  
 User Identification: PAC - Burley- TK05  
 City: Burley  
 State: Idaho  
 Company: Pacific Ethanol Burley, LLC  
 Type of Tank: Internal Floating Roof Tank  
 Description: Denatured Ethanol Storage Tank

**Tank Dimensions**  
 Diameter (ft): 40.00  
 Volume (gallons): 500,000.00  
 Turnovers: 63.00  
 Self Supp. Roof? (y/n): N  
 No. of Columns: 1.00  
 Eff. Col. Diam. (ft): 1.00

**Paint Characteristics**  
 Internal Shell Condition: Light Rust  
 Shell Color/Shade: White/White  
 Shell Condition: Good  
 Roof Color/Shade: White/White  
 Roof Condition: Good

**Rim-Seal System**  
 Primary Seal: Liquid-mounted  
 Secondary Seal: None

**Deck Characteristics**  
 Deck Fitting Category: Detail  
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg or Hanger Well/Adjustable	12
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Pocatello, Idaho (Avg Atmospheric Pressure = 12.53 psia)

# TANKS 4.0 Emissions Report - Detail Format Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.	Avg.	Min.	Max.					
Denatured Ethanol Ethyl alcohol Gasoline (RVP 10)	All	48.21	41.93	54.49	0.5284	N/A	N/A	50.0449	0.9500	0.7370	47.25	Option 2: A=8.321, B=1718.21, C=237.52 Option 4: RVP=10, ASTM Slope=3
					0.4341	N/A	N/A	46.0700	0.9500	0.2630	46.07	
					4.1037	N/A	N/A	66.0000	0.9500		92.00	

# TANKS 4.0

## Emissions Report - Detail Format

### Detail Calculations (AP-42)

Annual Emission Calculations	
Rim Seal Losses (lb):	34,5019
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1/2</sup> ):	0.3000
Value of Vapor Pressure Function:	0.0108
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5284
Tank Diameter (ft):	40.0000
Vapor Molecular Weight (lb/lb-mole):	50.0449
Product Factor:	1.0000
Withdrawal Losses (lb):	178,0864
Number of Columns:	1.0000
Effective Column Diameter (ft):	1.0000
Annual Net Throughput (gal/yr):	31,500,000.00
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.5509
Tank Diameter (ft):	40.0000
Deck Fitting Losses (lb):	127.9264
Value of Vapor Pressure Function:	0.0108
Vapor Molecular Weight (lb/lb-mole):	50.0449
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact (lb-mole/yr):	237.3000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor (ft/sqft):	0.0000
Tank Diameter (ft):	40.0000
Vapor Molecular Weight (lb/lb-mole):	50.0449
Product Factor:	1.0000

Deck Fitting/Status	Quantity	Deck Fitting Loss Factors		m	Losses (lb.)
		KFa (lb-mole/yr)	KFb (lb-mole/yr mph <sup>1/2</sup> m)		
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	1	31.00	5.20	1.30	16,7118
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	2,3181
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	1	33.00	0.00	0.00	17,7900
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	30,1891
Roof Leg or Hanger Well/Adjustable	12	7.90	0.00	0.00	51,1059
Sample Pipe or Well (24-in. Diam.)/Silt Fabric Seal 10% Open	1	12.00	0.00	0.00	6,4691
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	3,3424

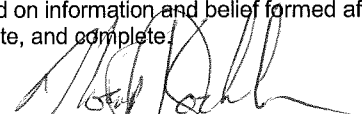
Total Losses (lb): 340,5147



**STATE OF IDAHO**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**

**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**  
**(IDAPA 58.01.01.200-.225)**

**SECTION 1: GENERAL INFORMATION**

1. COMPANY AND DIVISION NAME Pacific Ethanol Inc., Pacific Ethanol Burley, LLC																	
2. MAILING ADDRESS 516 Southeast Morrison St.		COUNTY Multnomah	NUMBER OF FULL-TIME EMPLOYEES 40														
3. CITY Portland	STATE Oregon	ZIP CODE 97214	TELEPHONE NUMBER 503-490-1070														
4. PERSON TO CONTACT Tom Koehler			TITLE President														
5. EXACT PLANT LOCATION (IDENTIFY LOCALITY, AND INCLUDE UTM COORDINATES IF KNOWN)																	
6. GENERAL NATURE OF BUSINESS AND KINDS OF PRODUCTS Fuel grade ethanol production.																	
7. REASON FOR APPLICATION  <input checked="" type="checkbox"/> permit to construct a new facility  <input type="checkbox"/> permit to modify an existing source permit number _____  <input type="checkbox"/> permit to construct a new source at an existing facility  <input type="checkbox"/> change of owner or location permit number _____ current owner _____		8. LIST ALL FACILITIES WITHIN THE STATE THAT ARE UNDER YOUR CONTROL OR UNDER COMMON CONTROL AND HAVE EMISSIONS TO THE AIR. IF NONE, SO STATE.															
		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 50%;">NAME</th><th style="width: 50%;">LOCATION</th></tr></thead><tbody><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></tbody></table>		NAME	LOCATION												
NAME	LOCATION																
9. ESTIMATED CONSTRUCTION START DATE 10/24/06		ESTIMATED COMPLETION DATE 9/07															
10. NAME AND TITLE OF OWNER OR RESPONSIBLE OFFICIAL Tom Koehler, President																	
11. In accordance with IDAPA 58.01.01.123 ( <i>Rules for the Control of Air Pollution in Idaho</i> ), I, <u>Tom Koehler</u> , certify based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.																	
SIGNATURE 		DATE <u>10-25-06</u>															

**The following information, at a minimum, must be included in the application package in order for the application to be determined complete:**

- A scaled plot plan clearly showing property boundaries and stack and building locations;*
- All calculations and assumptions used to estimate emissions;*
- Manufacturer's guarantees for stated control efficiencies of all control equipment;*
- A description of potential fugitive emissions;*
- A narrative description of the facility and the process from feed material in to final product out;*
- A process flow diagram; and*
- Any other information required by the DEQ to determine the application complete.*

**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 2: FUEL-BURNING EQUIPMENT** *(complete a separate page for each unit)*

1. APPLICANT'S REFERENCE NUMBER CE09			
2. EQUIPMENT MANUFACTURER AND MODEL NUMBER TBD		3. RATED HEAT INPUT CAPACITY 6 MMBtu/hr	4. BURNER UNIT TYPE (use code) 8
		5. HEAT USAGE % process 100      % space heating	

6. FUEL DATA				9. POLLUTION CONTROL EQUIPMENT					
	Primary	Secondary			Primary	Secondary			
fuel type (use code)	1			type					
percent sulfur	0.05%			manufacturer					
percent ash	1.6%			model number					
percent nitrogen	<0.05%			% efficiency					
percent carbon	<0.05%			MANUFACTURER GUARANTEED _____ yes _____ no					
percent hydrogen	<0.05%			<i>(Include guarantee)</i>					
percent moisture	<0.05%			for wet scrubbers:					
heat content	1,020 Btu/cf			water flow _____ gpm					
<i>(percent by weight or volume)</i>				pressure drop _____ inches of water					
7. FUEL CONSUMPTION				for baghouse:					
	Primary	Secondary		air/cloth ratio _____					
Maximum amount burned/hour	0.0058 MMcf/hr			pressure drop _____ inches of water					
Normal amount burned/year	51.52 MMcf/yr								
Fly ash reinjection? _____ yes <input checked="" type="checkbox"/> no _____ n.a.				10. STACK OR EXHAUST DATA					
8. OPERATING SCHEDULE				Stack ID SV09					
				Height 45 ft					
Hours per day	24			Exit diameter 5 ft					
Days per week	7			Exit gas volume 18,000 acfm					
Weeks per year	52			Exit gas temperature 180 F					
				<i>(Include a separate page for each stack if multiple stacks or vents are used)</i>					
				<i>(are used)</i>					
11. CRITERIA POLLUTANT ESTIMATED EMISSIONS									
Particulates	0.05	lb/hr	0.2	tons/yr	Nitrogen oxides	0.29	lb/hr	1.31	tons/yr
Sulfur dioxide	0.005	lb/hr	0.02	tons/yr	Volatile organic	2.25	lb/hr	9.85	tons/yr
Carbon monoxide	0.51	lb/hr	2.25	tons/yr	compounds				
<i>(Include calculations and assumptions)</i>									
FUEL CODES					BURNER CODES				
1. Natural gas					1. Spreader stoker				
2. Oil (specify ASTM grade number)					7. Underfeed stoker				
3. Wood (specify chips, bark, shavings sander dust)					8. Tangentially fired				
4. Coal (specify bituminous, antracite, lignite)					9. Horizontally fired				
5. Other (specify)					10. Other (specify)				
					6. Dry bottom (pulverized coal)				

**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 2: FUEL-BURNING EQUIPMENT** *(complete a separate page for each unit)*

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: right; margin-right: 50px;">EU36</div>					
2. EQUIPMENT MANUFACTURER AND MODEL NUMBER <div style="text-align: center; margin-top: 10px;">TBD</div>		3. RATED HEAT INPUT CAPACITY <div style="text-align: center; margin-top: 10px;">75.6 MMBtu/hr</div>			
4. BURNER UNIT TYPE (use code) <div style="text-align: center; margin-top: 10px;">8</div>		5. HEAT USAGE <table style="width:100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">% process 100</td> <td style="width: 50%; text-align: center;">% space heating</td> </tr> </table>		% process 100	% space heating
% process 100	% space heating				

6. FUEL DATA <table style="width:100%; border: none; margin-top: 10px;"> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;">Primary</th> <th style="width: 20%; text-align: center;">Secondary</th> </tr> <tr> <td>fuel type (use code)</td> <td style="text-align: center;">1</td> <td></td> </tr> <tr> <td>percent sulfur</td> <td style="text-align: center;">0.05%</td> <td></td> </tr> <tr> <td>percent ash</td> <td style="text-align: center;">1.6%</td> <td></td> </tr> <tr> <td>percent nitrogen</td> <td style="text-align: center;">&lt;0.05%</td> <td></td> </tr> <tr> <td>percent carbon</td> <td style="text-align: center;">&lt;0.05%</td> <td></td> </tr> <tr> <td>percent hydrogen</td> <td style="text-align: center;">&lt;0.05%</td> <td></td> </tr> <tr> <td>percent moisture</td> <td style="text-align: center;">&lt;0.05%</td> <td></td> </tr> <tr> <td>heat content</td> <td style="text-align: center;">1,020 Btu/cf</td> <td></td> </tr> <tr> <td colspan="3"><i>(percent by weight or volume)</i></td> </tr> </table>					Primary	Secondary	fuel type (use code)	1		percent sulfur	0.05%		percent ash	1.6%		percent nitrogen	<0.05%		percent carbon	<0.05%		percent hydrogen	<0.05%		percent moisture	<0.05%		heat content	1,020 Btu/cf		<i>(percent by weight or volume)</i>			9. POLLUTION CONTROL EQUIPMENT <table style="width:100%; border: none; margin-top: 10px;"> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;">Primary</th> <th style="width: 20%; text-align: center;">Secondary</th> </tr> <tr> <td>type</td> <td></td> <td></td> </tr> <tr> <td>manufacturer</td> <td></td> <td></td> </tr> <tr> <td>model number</td> <td></td> <td></td> </tr> <tr> <td>% efficiency</td> <td></td> <td></td> </tr> </table> <p>MANUFACTURER GUARANTEED _____ yes _____ no  <i>(Include guarantee)</i></p> <p>for wet scrubbers:              water flow _____ gpm              pressure drop _____ inches of water</p> <p>for baghouse:              air/cloth ratio _____              pressure drop _____ inches of water</p>					Primary	Secondary	type			manufacturer			model number			% efficiency		
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 2: FUEL-BURNING EQUIPMENT** *(complete a separate page for each unit)*

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: center;">EU37</div>			
2. EQUIPMENT MANUFACTURER AND MODEL NUMBER <div style="text-align: center;">TBD</div>		3. RATED HEAT INPUT CAPACITY <div style="text-align: center;">75.6 MMBtu/hr</div>	4. BURNER UNIT TYPE (use code) <div style="text-align: center;">8</div>
5. HEAT USAGE % process <div style="text-align: center;">100</div> % space heating <div style="text-align: center;"></div>			

6. FUEL DATA			9. POLLUTION CONTROL EQUIPMENT		
	Primary	Secondary		Primary	Secondary
fuel type (use code)	1		type		
percent sulfur	0.05%		manufacturer		
percent ash	1.6%		model number		
percent nitrogen	<0.05%		% efficiency		
percent carbon	<0.05%		MANUFACTURER GUARANTEED <input type="checkbox"/> yes <input type="checkbox"/> no (Include guarantee)		
percent hydrogen	<0.05%				
percent moisture	<0.05%				
heat content	1,020 Btu/cf				
(percent by weight or volume)			for wet scrubbers:		
			water flow _____ gpm		
			pressure drop _____ inches of water		

7. FUEL CONSUMPTION			10. STACK OR EXHAUST DATA		
	Primary	Secondary		Primary	Secondary
Maximum amount burned/hour	0.0741 MMcf/hr		for baghouse:		
Normal amount burned/year	650 MMcf/hr		air/cloth ratio _____		
			pressure drop _____ inches of water		
Fly ash reinjection? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> n.a.			Stack ID <u>SV11</u> Height <u>45</u> ft Exit diameter <u>3</u> ft Exit gas volume <u>16,008</u> acfm Exit gas temperature <u>310</u> F  <i>(Include a separate page for each stack if multiple stacks or vents are used)</i>		

8. OPERATING SCHEDULE							
Hours per day	24						
Days per week	7						
Weeks per year	52						

11. CRITERIA POLLUTANT ESTIMATED EMISSIONS							
Particulates	0.56	lb/hr	2.47	tons/yr	Nitrogen oxides	3.78	lb/hr
Sulfur dioxide	0.04	lb/hr	0.19	tons/yr	Volatile organic compounds	0.41	lb/hr
Carbon monoxide	2.39	lb/hr	10.48	tons/yr		16.56	tons/yr
(Include calculations and assumptions)							

<b>FUEL CODES</b> 1. Natural gas 2. Oil <i>(specify ASTM grade number)</i> 3. Wood <i>(specify chips, bark, shavings, sander dust)</i> 4. Coal <i>(specify bituminous, anthracite, lignite)</i> 5. Other <i>(specify)</i>	<b>BURNER CODES</b> 1. Spreader stoker 2. Chain or traveling grate 3. Hand fired 4. Cyclone furnace 5. Wet bottom <i>(pulverized coal)</i> 6. Dry bottom <i>(pulverized coal)</i> 7. Underfeed stoker 8. Tangentially fired 9. Horizontally fired 10. Other <i>(specify)</i>
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 2: FUEL-BURNING EQUIPMENT** (complete a separate page for each unit)

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: right; margin-right: 50px;">EU38</div>																																																																								
2. EQUIPMENT MANUFACTURER AND MODEL NUMBER <div style="text-align: center;">TBD</div>	3. RATED HEAT INPUT CAPACITY <div style="text-align: center;">75.6 MMBtu/hr</div>	4. BURNER UNIT TYPE (use code) <div style="text-align: center;">8</div>	5. HEAT USAGE <div style="display: flex; justify-content: space-between;"> <span>% process 100</span> <span>% space heating</span> </div>																																																																					
6. FUEL DATA <table style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th style="text-align: center;">Primary</th> <th style="text-align: center;">Secondary</th> </tr> <tr><td style="padding: 2px;">fuel type (use code)</td><td style="text-align: center;">1</td><td></td></tr> <tr><td style="padding: 2px;">percent sulfur</td><td style="text-align: center;">0.05%</td><td></td></tr> <tr><td style="padding: 2px;">percent ash</td><td style="text-align: center;">1.6%</td><td></td></tr> <tr><td style="padding: 2px;">percent nitrogen</td><td style="text-align: center;">&lt;0.05%</td><td></td></tr> <tr><td style="padding: 2px;">percent carbon</td><td style="text-align: center;">&lt;0.05%</td><td></td></tr> <tr><td style="padding: 2px;">percent hydrogen</td><td style="text-align: center;">&lt;0.05%</td><td></td></tr> <tr><td style="padding: 2px;">percent moisture</td><td style="text-align: center;">&lt;0.05%</td><td></td></tr> <tr><td style="padding: 2px;">heat content</td><td style="text-align: center;">1,020 Btu/cf</td><td></td></tr> <tr><td colspan="3" style="padding: 2px;">(percent by weight or volume)</td></tr> </table>			Primary	Secondary	fuel type (use code)	1		percent sulfur	0.05%		percent ash	1.6%		percent nitrogen	<0.05%		percent carbon	<0.05%		percent hydrogen	<0.05%		percent moisture	<0.05%		heat content	1,020 Btu/cf		(percent by weight or volume)			9. POLLUTION CONTROL EQUIPMENT <table style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th style="text-align: center;">Primary</th> <th style="text-align: center;">Secondary</th> </tr> <tr><td style="padding: 2px;">type</td><td></td><td></td></tr> <tr><td style="padding: 2px;">manufacturer</td><td></td><td></td></tr> <tr><td style="padding: 2px;">model number</td><td></td><td></td></tr> <tr><td style="padding: 2px;">% efficiency</td><td></td><td></td></tr> <tr><td colspan="3" style="padding: 2px;">MANUFACTURER GUARANTEED _____ yes _____ no</td></tr> <tr><td colspan="3" style="padding: 2px;">(Include guarantee)</td></tr> <tr><td colspan="3" style="padding: 2px;">for wet scrubbers:</td></tr> <tr><td colspan="3" style="padding: 2px;">water flow _____ gpm</td></tr> <tr><td colspan="3" style="padding: 2px;">pressure drop _____ inches of water</td></tr> <tr><td colspan="3" style="padding: 2px;">for baghouse:</td></tr> <tr><td colspan="3" style="padding: 2px;">air/cloth ratio _____</td></tr> <tr><td colspan="3" style="padding: 2px;">pressure drop _____ inches of water</td></tr> </table>			Primary	Secondary	type			manufacturer			model number			% efficiency			MANUFACTURER GUARANTEED _____ yes _____ no			(Include guarantee)			for wet scrubbers:			water flow _____ gpm			pressure drop _____ inches of water			for baghouse:			air/cloth ratio _____			pressure drop _____ inches of water		
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<div style="display: flex;"> <div style="flex: 1; padding-right: 10px;"> <b>FUEL CODES</b>            1. Natural gas            2. Oil (specify ASTM grade number)            3. Wood (specify chips, bark, shavings, sander dust)            4. Coal (specify bituminous, antracite, lignite)            5. Other (specify)         </div> <div style="flex: 1;"> <b>BURNER CODES</b>            1. Spreader stoker            2. Chain or traveling grate            3. Hand fired            4. Cyclone furnace            5. Wet bottom (pulverized coal)            6. Dry bottom (pulverized coal)            7. Underfeed stoker            8. Tangentially fired            9. Horizontally fired            10. Other (specify)         </div> </div>																																																																								

## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU01</u>		2. PROCESS OR OPERATION NAME <u>Corn Receiving</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>20,000 Bu/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																									
6. PROCESS EQUIPMENT  <div style="text-align: right; margin-right: 20px;">Type <u>Truck Dump Pit</u></div> <div style="text-align: right; margin-right: 20px;">Manufacturer <u>TBD</u></div> <div style="text-align: right; margin-right: 20px;">Model Number <u>TBD</u></div> <div style="text-align: right; margin-right: 20px;">Feed Material <u>Corn</u></div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>baghouse</u></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>99%</u></td> <td></td> </tr> </table>			Primary	Secondary	Type	<u>baghouse</u>		Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>											
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU02</u>		2. PROCESS OR OPERATION NAME <u>Corn Receiving</u>																										
3. MAXIMUM RATED INPUT CAPACITY <i>(tons/hour)*</i> <u>20,000 Bu/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																									
6. PROCESS EQUIPMENT  Type <u>Rail Dump Pit</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"></td> <td style="width:25%; text-align: center;">Primary</td> <td style="width:25%; text-align: center;">Secondary</td> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>baghouse</u></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>99%</u></td> <td></td> </tr> </table>			Primary	Secondary	Type	<u>baghouse</u>		Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>											
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8. STACK OR EXHAUST DATA  Stack ID <u>SV01</u> Height <u>30</u> ft Exit diameter <u>1.47</u> ft Exit gas volume <u>10,222</u> acfm Exit gas temperature <u>ambient</u> F  <i>(Include a separate page for each stack if multiple stacks or vents are used)</i>		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS Total emissions for the <u>Corn Receiving Baghouse</u> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:40%;">particulates</td> <td style="width:15%; text-align: center;"><u>0.86</u></td> <td style="width:15%; text-align: center;"><u>lb/hr</u></td> <td style="width:10%; text-align: center;"><u>3.75</u></td> <td style="width:20%; text-align: center;"><u>tons/yr</u></td> </tr> <tr> <td>sulfur dioxide</td> <td></td> <td style="text-align: center;"><u>lb/hr</u></td> <td></td> <td style="text-align: center;"><u>tons/yr</u></td> </tr> <tr> <td>carbon monoxide</td> <td></td> <td style="text-align: center;"><u>lb/hr</u></td> <td></td> <td style="text-align: center;"><u>tons/yr</u></td> </tr> <tr> <td>nitrogen oxides</td> <td></td> <td style="text-align: center;"><u>lb/hr</u></td> <td></td> <td style="text-align: center;"><u>tons/yr</u></td> </tr> <tr> <td>volatile organic compounds</td> <td></td> <td style="text-align: center;"><u>lb/hr</u></td> <td></td> <td style="text-align: center;"><u>tons/yr</u></td> </tr> </table> <i>(Include calculations and assumptions)</i>		particulates	<u>0.86</u>	<u>lb/hr</u>	<u>3.75</u>	<u>tons/yr</u>	sulfur dioxide		<u>lb/hr</u>		<u>tons/yr</u>	carbon monoxide		<u>lb/hr</u>		<u>tons/yr</u>	nitrogen oxides		<u>lb/hr</u>		<u>tons/yr</u>	volatile organic compounds		<u>lb/hr</u>		<u>tons/yr</u>
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU03</u>		2. PROCESS OR OPERATION NAME <u>Corn Handling</u>																																																							
3. MAXIMUM RATED INPUT CAPACITY <i>(tons/hour)*</i> <u>20,000 Bu/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																																																						
6. PROCESS EQUIPMENT  Type <u>Corn Conveyor #1</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:50%;"></th> <th style="width:25%;">Primary baghouse</th> <th style="width:25%;">Secondary</th> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>99%</u></td> <td></td> </tr> </table>			Primary baghouse	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>																																								
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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6. PROCESS EQUIPMENT  Type <u>Scalper</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Primary baghouse</th> <th style="width: 25%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>99%</u></td> <td></td> </tr> </table>			Primary baghouse	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>						
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8. STACK OR EXHAUST DATA  Stack ID <u>SV02</u> Height <u>30</u> ft Exit diameter <u>1.47</u> ft Exit gas volume <u>10,222</u> acfm Exit gas temperature <u>ambient</u> F  (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS Total emissions for the Corn Handling Baghouse <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">particulates</td> <td style="width: 15%; text-align: center;"><u>0.43</u></td> <td style="width: 15%; text-align: center;"><u>1.88</u></td> <td style="width: 30%; text-align: center;">lb/hr    tons/yr</td> </tr> <tr> <td>sulfur dioxide</td> <td></td> <td></td> <td style="text-align: center;">lb/hr    tons/yr</td> </tr> <tr> <td>carbon monoxide</td> <td></td> <td></td> <td style="text-align: center;">lb/hr    tons/yr</td> </tr> <tr> <td>nitrogen oxides</td> <td></td> <td></td> <td style="text-align: center;">lb/hr    tons/yr</td> </tr> <tr> <td>volatile organic compounds</td> <td></td> <td></td> <td style="text-align: center;">lb/hr    tons/yr</td> </tr> </table> (Include calculations and assumptions)		particulates	<u>0.43</u>	<u>1.88</u>	lb/hr    tons/yr	sulfur dioxide			lb/hr    tons/yr	carbon monoxide			lb/hr    tons/yr	nitrogen oxides			lb/hr    tons/yr	volatile organic compounds			lb/hr    tons/yr
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU08</u>		2. PROCESS OR OPERATION NAME <u>Corn Handling</u>																					
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>20,000 Bu/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>108</u> <u>629,213</u>																				
6. PROCESS EQUIPMENT  Type <u>Corn Conveyor #3</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 30%;">Primary</th> <th style="width: 30%;">Secondary</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td><u>baghouse</u></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>99%</u></td> <td></td> </tr> </tbody> </table>			Primary	Secondary	Type	<u>baghouse</u>		Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>						
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU09</u>		2. PROCESS OR OPERATION NAME <u>Corn Bin #1 Spot Filters</u>																																																							
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>262,700 Bushels</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																																																						
6. PROCESS EQUIPMENT  Type <u>Corn Bin #1</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 30%;">Primary spot filter</th> <th style="width: 30%;">Secondary</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>95%</u></td> <td></td> </tr> </tbody> </table>			Primary spot filter	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>95%</u>																																								
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8. STACK OR EXHAUST DATA  Stack ID <u>SV03</u> Height <u>67</u> ft Exit diameter <u>1.12</u> ft Exit gas volume <u>409</u> acfm Exit gas temperature <u>ambient</u> F  (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;">lb/hr</th> <th style="width: 10%;">0.15</th> <th style="width: 10%;">tons/yr</th> </tr> </thead> <tbody> <tr> <td>particulates</td> <td><u>0.03</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>sulfur dioxide</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>carbon monoxide</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>nitrogen oxides</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>volatile organic compounds</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> (Include calculations and assumptions)				lb/hr	0.15	tons/yr	particulates	<u>0.03</u>				sulfur dioxide					carbon monoxide					nitrogen oxides					volatile organic compounds																												
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>262,700 Bushels</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																									
6. PROCESS EQUIPMENT  Type <u>Corn Bin #2</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary spot filter</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>95%</u></td> <td></td> </tr> </table>			Primary spot filter	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>95%</u>											
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8. STACK OR EXHAUST DATA  Stack ID <u>SV04</u> Height <u>67</u> ft Exit diameter <u>1.12</u> ft Exit gas volume <u>409</u> acfm Exit gas temperature <u>ambient</u> F  (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">particulates</td> <td style="width: 10%; text-align: center;">0.03</td> <td style="width: 10%; text-align: center;">lb/hr</td> <td style="width: 10%; text-align: center;">0.15</td> <td style="width: 30%; text-align: center;">tons/yr</td> </tr> <tr> <td>sulfur dioxide</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>carbon monoxide</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>nitrogen oxides</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>volatile organic compounds</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> (Include calculations and assumptions)		particulates	0.03	lb/hr	0.15	tons/yr	sulfur dioxide					carbon monoxide					nitrogen oxides					volatile organic compounds				
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## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>1,200 Bushels</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>420</u> <u>629,213</u>																																																						
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU12</u>		2. PROCESS OR OPERATION NAME <u>Hammermilling</u>																																																							
3. MAXIMUM RATED INPUT CAPACITY <i>(tons/hour)*</i> <u>1,124 Bu/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>36</u> <u>629,213</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>36</u> <u>629,213</u>																																																						
6. PROCESS EQUIPMENT  <div style="margin-left: 40px;"> Type <u>Hammermill #1</u>  Manufacturer <u>TBD</u>  Model Number <u>TBD</u>  Feed Material <u>Corn</u> </div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary baghouse</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>99%</u></td> <td></td> </tr> </table> MANUFACTURER GUARANTEED <input checked="" type="checkbox"/> Yes <input type="checkbox"/> no <i>(Include guarantee)</i> For wet scrubbers: water flow _____ gpm pressure drop _____ inches of water  For baghouses: air/cloth ratio <u>7.6:1</u> pressure drop <u>TBD</u> inches of water			Primary baghouse	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>																																								
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: center;">EU13</div>		2. PROCESS OR OPERATION NAME <div style="text-align: center;">Hammermilling</div>																																																			
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6. PROCESS EQUIPMENT  <div style="margin-left: 40px;">Type <u>Hammermill #2</u></div> <div style="margin-left: 40px;">Manufacturer <u>TBD</u></div> <div style="margin-left: 40px;">Model Number <u>TBD</u></div> <div style="margin-left: 40px;">Feed Material <u>Corn</u></div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary baghouse</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>99%</u></td> <td></td> </tr> </table>			Primary baghouse	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>99%</u>																																				
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: center;">EU14</div>		2. PROCESS OR OPERATION NAME <div style="text-align: center;">Hammermilling</div>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* 1,124 Bu/hr	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year 36                                      629,213		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year 36                                      629,213																									
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**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU15</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																																																			
3. MAXIMUM RATED INPUT CAPACITY <i>(tons/hour)*</i> <u>11,000 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour _____ tons/year _____ <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour _____ tons/year _____ <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																																																		
6. PROCESS EQUIPMENT  <div style="margin-left: 40px;"> Type <u>Slurry Tank</u>  Manufacturer <u>TBD</u>  Model Number <u>TBD</u>  Feed Material <u>Ethanol</u> </div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"></td> <td style="width: 30%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 30%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>97%</u></td> <td style="text-align: center;"><u>99% overall</u></td> </tr> </table> MANUFACTURER GUARANTEED _____ Yes _____ no <i>(Include guarantee)</i> For wet scrubbers: water flow <u>35</u> gpm pressure drop <u>5.5</u> inches of water  For baghouses: air/cloth ratio _____ inches of water pressure drop _____ inches of water			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type	<u>TBD</u>	<u>TBD</u>	Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>																																			
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU16</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																																																			
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>58,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																																																		
6. PROCESS EQUIPMENT  Type <u>Liquefaction Tank</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn</u>		10. POLLUTION CONTROL EQUIPMENT  <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width:50%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u>                      <u>99% overall</u></td> </tr> </table> MANUFACTURER GUARANTEED <u>    </u> Yes <u>    </u> no (Include guarantee) For wet scrubbers: water flow <u>45</u> gpm pressure drop <u>5.5</u> inches of water  For baghouses: air/cloth ratio <u>                </u> pressure drop <u>                </u> inches of water		Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type		Manufacturer	<u>TBD</u>	Model Number	<u>TBD</u>	% Efficiency	<u>97%</u> <u>99% overall</u>																																								
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU17</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>146,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																									
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## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU18</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>560,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Fermenter #1</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn Slurry</u>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 25%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>97%</u></td> <td style="text-align: center;"><u>99% overall</u></td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type	<u>TBD</u>	<u>TBD</u>	Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>										
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STATE OF IDAHO

APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU19</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>560,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Fermenter #2</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn Slurry</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"></td> <td style="width:25%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width:25%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u></td> <td><u>99% overall</u></td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type			Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>										
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7. OPERATING SCHEDULE  Hours per day <u>24</u> Days per week <u>7</u> Weeks per year <u>52</u>		MANUFACTURER GUARANTEED <u>    </u> Yes <u>    </u> no (Include guarantee)  For wet scrubbers: water flow <u>45</u> gpm pressure drop <u>5.5</u> inches of water  For baghouses: air/cloth ratio <u>                </u> pressure drop <u>                </u> inches of water																										
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU20</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>560,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Fermenter #3</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn Slurry</u>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 25%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u></td> <td><u>99% overall</u></td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type			Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>										
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU21</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>560,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour <u>65,000 gal/hr</u> tons/year <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour <u>65,000 gal/hr</u> tons/year <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Fermenter #4</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Corn Slurry</u>		10. POLLUTION CONTROL EQUIPMENT  <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 50%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u>      <u>99% overall</u></td> </tr> </table>		Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type		Manufacturer	<u>TBD</u>	Model Number	<u>TBD</u>	% Efficiency	<u>97%</u> <u>99% overall</u>															
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STATE OF IDAHO

APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU22</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>729,400 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour <u>65,000 gal/hr</u> tons/year <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour <u>65,000 gal/hr</u> tons/year <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Beerwell</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Beer</u>		10. POLLUTION CONTROL EQUIPMENT  <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width:50%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u>      <u>99% overall</u></td> </tr> </table>		Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type		Manufacturer	<u>TBD</u>	Model Number	<u>TBD</u>	% Efficiency	<u>97%</u> <u>99% overall</u>															
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU23</u>		2. PROCESS OR OPERATION NAME <u>Fermentation</u>																																																			
3. MAXIMUM RATED INPUT CAPACITY <i>(tons/hour)*</i> <u>TBD</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>65,000 gal/hr</u> <u>60 MMGal/yr</u>																																																		
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU24</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>26,000 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour <u>7,050 gal/hr</u> tons/year <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour <u>7,050 gal/hr</u> tons/year <u>60 MMGal/yr</u>																									
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>10,100 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
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STATE OF IDAHO

APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <div style="text-align: center;">EU26</div>		2. PROCESS OR OPERATION NAME <div style="text-align: center;">Distillation</div>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* 27,400 gallons	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year 7,050 gal/hr                      60 MMGal/yr		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year 7,050 gal/hr                      60 MMGal/yr																									
6. PROCESS EQUIPMENT  <div style="text-align: right; margin-right: 20px;">Type</div> <div>Rectifier Column</div> <div style="text-align: right; margin-right: 20px;">Manufacturer</div> <div>TBD</div> <div style="text-align: right; margin-right: 20px;">Model Number</div> <div>TBD</div> <div style="text-align: right; margin-right: 20px;">Feed Material</div> <div>Ethanol</div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"></td> <td style="width: 30%; text-align: center;">Primary</td> <td style="width: 30%; text-align: center;">Secondary</td> </tr> <tr> <td style="text-align: right;">Type</td> <td style="text-align: center;">CO<sub>2</sub> Scrubber</td> <td style="text-align: center;">RTO</td> </tr> <tr> <td style="text-align: right;">Manufacturer</td> <td style="text-align: center;">TBD</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td style="text-align: right;">Model Number</td> <td style="text-align: center;">TBD</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td style="text-align: right;">% Efficiency</td> <td style="text-align: center;">97%</td> <td style="text-align: center;">99% overall</td> </tr> </table>			Primary	Secondary	Type	CO <sub>2</sub> Scrubber	RTO	Manufacturer	TBD	TBD	Model Number	TBD	TBD	% Efficiency	97%	99% overall										
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STATE OF IDAHO

APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU27</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>5,708 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU29</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																																																			
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>138,200 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																																																		
6. PROCESS EQUIPMENT  Type <u>Whole Stillage Tank</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Wetcake</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Type <u>Primary CO<sub>2</sub> Scrubber</u></td> <td style="width: 50%; padding: 5px;">Secondary <u>RTO</u></td> </tr> <tr> <td style="padding: 5px;">Manufacturer <u>TBD</u></td> <td style="padding: 5px;">TBD</td> </tr> <tr> <td style="padding: 5px;">Model Number <u>TBD</u></td> <td style="padding: 5px;">TBD</td> </tr> <tr> <td style="padding: 5px;">% Efficiency <u>97%</u></td> <td style="padding: 5px;">99% overall</td> </tr> </table>		Type <u>Primary CO<sub>2</sub> Scrubber</u>	Secondary <u>RTO</u>	Manufacturer <u>TBD</u>	TBD	Model Number <u>TBD</u>	TBD	% Efficiency <u>97%</u>	99% overall																																										
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**STATE OF IDAHO**  
**APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY**

**SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT** *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <u>EU30</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																																																			
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>38,000 gallons</u>	4. NORMAL MAXIMUM FEED INPUT <div style="display: flex; justify-content: space-between;"> <div>tons/hour <u>7,050 gal/hr</u></div> <div>tons/year <u>60 MMGal/yr</u></div> </div>		5. NORMAL MAXIMUM PRODUCT OUTPUT <div style="display: flex; justify-content: space-between;"> <div>tons/hour <u>7,050 gal/hr</u></div> <div>tons/year <u>60 MMGal/yr</u></div> </div>																																																		
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

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3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>22,500 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
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8. STACK OR EXHAUST DATA  <div style="margin-left: 40px;"> Stack ID <u>SV09</u>  Height <u>45</u> ft  Exit diameter <u>5</u> ft  Exit gas volume <u>18,000</u> acfm  Exit gas temperature <u>180</u> F </div> (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS Total emissions for the RTO stack.  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">particulates</td> <td style="width: 15%; text-align: center;">0.05</td> <td style="width: 15%; text-align: center;">lb/hr</td> <td style="width: 15%; text-align: center;">0.20</td> <td style="width: 15%; text-align: center;">tons/yr</td> </tr> <tr> <td>sulfur dioxide</td> <td style="text-align: center;">.005</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">0.02</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>carbon monoxide</td> <td style="text-align: center;">0.51</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">2.25</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>nitrogen oxides</td> <td style="text-align: center;">0.29</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">1.31</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>volatile organic compounds</td> <td style="text-align: center;">2.25</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">9.85</td> <td style="text-align: center;">tons/yr</td> </tr> </table> (Include calculations and assumptions)		particulates	0.05	lb/hr	0.20	tons/yr	sulfur dioxide	.005	lb/hr	0.02	tons/yr	carbon monoxide	0.51	lb/hr	2.25	tons/yr	nitrogen oxides	0.29	lb/hr	1.31	tons/yr	volatile organic compounds	2.25	lb/hr	9.85	tons/yr
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU32</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>19,673 lb/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Centrifuge #1</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Wetcake</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 25%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td><u>97%</u></td> <td><u>99% overall</u></td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type			Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>										
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU33</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>19,673 lb/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  Type <u>Centrifuge #2</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Wetcake</u>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Type</td> <td style="width: 25%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 25%; text-align: center;">Secondary RTO</td> </tr> <tr> <td style="text-align: center;">Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td style="text-align: center;">Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td style="text-align: center;">% Efficiency</td> <td style="text-align: center;"><u>97%</u></td> <td style="text-align: center;"><u>99% overall</u></td> </tr> </table>		Type	Primary CO <sub>2</sub> Scrubber	Secondary RTO	Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>													
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <b>EU34</b>		2. PROCESS OR OPERATION NAME <b>Distillation</b>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <b>5,700 gallons</b>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <b>7,050 gal/hr                      60 MMGal/yr</b>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <b>7,050 gal/hr                      60 MMGal/yr</b>																									
6. PROCESS EQUIPMENT  <div style="text-align: right; margin-right: 20px;">Type <b>Syrup Tank</b></div> <div style="text-align: right; margin-right: 20px;">Manufacturer <b>TBD</b></div> <div style="text-align: right; margin-right: 20px;">Model Number <b>TBD</b></div> <div style="text-align: right; margin-right: 20px;">Feed Material <b>Syrup</b></div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"></td> <td style="width: 30%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 30%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td style="text-align: center;">TBD</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;">TBD</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;">TBD</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;">97%</td> <td style="text-align: center;">99% overall</td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type	TBD	TBD	Manufacturer	TBD	TBD	Model Number	TBD	TBD	% Efficiency	97%	99% overall										
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU35</u>		2. PROCESS OR OPERATION NAME <u>Distillation</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>102,000 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>7,050 gal/hr</u> <u>60 MMGal/yr</u>																									
6. PROCESS EQUIPMENT  <div style="text-align: right; margin-right: 20px;">Type <u>Thin Stillage</u></div> <div style="text-align: right; margin-right: 20px;">Manufacturer <u>TBD</u></div> <div style="text-align: right; margin-right: 20px;">Model Number <u>TBD</u></div> <div style="text-align: right; margin-right: 20px;">Feed Material <u>Wetcake</u></div>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"></td> <td style="width: 30%; text-align: center;">Primary CO<sub>2</sub> Scrubber</td> <td style="width: 30%; text-align: center;">Secondary RTO</td> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;"><u>TBD</u></td> <td style="text-align: center;"><u>TBD</u></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>97%</u></td> <td style="text-align: center;"><u>99% overall</u></td> </tr> </table>			Primary CO <sub>2</sub> Scrubber	Secondary RTO	Type	<u>TBD</u>	<u>TBD</u>	Manufacturer	<u>TBD</u>	<u>TBD</u>	Model Number	<u>TBD</u>	<u>TBD</u>	% Efficiency	<u>97%</u>	<u>99% overall</u>										
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7. OPERATING SCHEDULE  <div style="text-align: right; margin-right: 20px;">Hours per day <u>24</u></div> <div style="text-align: right; margin-right: 20px;">Days per week <u>7</u></div> <div style="text-align: right; margin-right: 20px;">Weeks per year <u>52</u></div>		MANUFACTURER GUARANTEED <input type="checkbox"/> Yes <input type="checkbox"/> no (Include guarantee)  For wet scrubbers: <div style="text-align: right; margin-right: 20px;">water flow <u>35</u> gpm</div> <div style="text-align: right; margin-right: 20px;">pressure drop <u>5.5</u> inches of water</div>  For baghouses: <div style="text-align: right; margin-right: 20px;">air/cloth ratio _____</div> <div style="text-align: right; margin-right: 20px;">pressure drop _____ inches of water</div>																										
8. STACK OR EXHAUST DATA  <div style="text-align: right; margin-right: 20px;">Stack ID <u>SV09</u></div> <div style="text-align: right; margin-right: 20px;">Height <u>45</u> ft</div> <div style="text-align: right; margin-right: 20px;">Exit diameter <u>5</u> ft</div> <div style="text-align: right; margin-right: 20px;">Exit gas volume <u>18,000</u> acfm</div> <div style="text-align: right; margin-right: 20px;">Exit gas temperature <u>180</u> F</div> (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS  Total emissions for the RTO stack. <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">particulates</td> <td style="width: 15%; text-align: center;">0.05</td> <td style="width: 15%; text-align: center;">lb/hr</td> <td style="width: 15%; text-align: center;">0.20</td> <td style="width: 15%; text-align: center;">tons/yr</td> </tr> <tr> <td>sulfur dioxide</td> <td style="text-align: center;">.005</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">0.02</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>carbon monoxide</td> <td style="text-align: center;">0.51</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">2.25</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>nitrogen oxides</td> <td style="text-align: center;">0.29</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">1.31</td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>volatile organic compounds</td> <td style="text-align: center;">2.25</td> <td style="text-align: center;">lb/hr</td> <td style="text-align: center;">9.85</td> <td style="text-align: center;">tons/yr</td> </tr> </table> (Include calculations and assumptions)		particulates	0.05	lb/hr	0.20	tons/yr	sulfur dioxide	.005	lb/hr	0.02	tons/yr	carbon monoxide	0.51	lb/hr	2.25	tons/yr	nitrogen oxides	0.29	lb/hr	1.31	tons/yr	volatile organic compounds	2.25	lb/hr	9.85	tons/yr
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU39</u>		2. PROCESS OR OPERATION NAME <u>Ethanol Loadout</u>																															
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>36,000 gal/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>38,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>38,000 gal/hr</u> <u>60 MMGal/yr</u>																														
6. PROCESS EQUIPMENT  Type <u>Ethanol Truck Loadout</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Ethanol</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%;">Primary RTO</th> <th style="width: 25%;">Secondary</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>98%</u></td> <td></td> </tr> </tbody> </table>			Primary RTO	Secondary	Type			Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>98%</u>																
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>EU40</u>		2. PROCESS OR OPERATION NAME <u>Ethanol Loadout</u>																																																							
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>60,000 gal/hr</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>60,000 gal/hr</u> <u>60 MMGal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>60,000 gal/hr</u> <u>60 MMGal/yr</u>																																																						
6. PROCESS EQUIPMENT  Type <u>Ethanol Rail Loadout</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Ethanol</u>		10. POLLUTION CONTROL EQUIPMENT <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%;">Primary</th> <th style="width: 30%;">Secondary</th> </tr> <tr> <td>Type</td> <td><u>RTO</u></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>Model Number</td> <td><u>TBD</u></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td><u>98%</u></td> <td></td> </tr> </table>			Primary	Secondary	Type	<u>RTO</u>		Manufacturer	<u>TBD</u>		Model Number	<u>TBD</u>		% Efficiency	<u>98%</u>																																								
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <b>TK01</b>		2. PROCESS OR OPERATION NAME <b>Storage Tanks</b>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <b>39,000 gallons</b>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <b>70 gal/hr                      600,000 gal/yr</b>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <b>70 gal/hr                      600,000 gal/yr</b>																									
6. PROCESS EQUIPMENT  Type <b>190 Proof Storage Tank</b> Manufacturer <b>TBD</b> Model Number <b>TBD</b> Feed Material <b>Ethanol</b>		10. POLLUTION CONTROL EQUIPMENT <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;">Internal Floating Roof</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;">99%</td> <td></td> </tr> </table>			Primary	Secondary	Type	Internal Floating Roof		Manufacturer	TBD		Model Number	TBD		% Efficiency	99%											
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1. APPLICANT'S REFERENCE NUMBER <div style="text-align: center;">TK02</div>		2. PROCESS OR OPERATION NAME <div style="text-align: center;">Storage Tanks</div>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* 74,300 gallons	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year 350 gal/hr                      3,000,000 gal/yr		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year 350 gal/hr                      3,000,000 gal/yr																									
6. PROCESS EQUIPMENT  Type: <u>Denaturant Storage Tank</u> Manufacturer: <u>TBD</u> Model Number: <u>TBD</u> Feed Material: <u>Gasoline</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;">Internal Floating Roof</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;">99%</td> <td></td> </tr> </table>			Primary	Secondary	Type	Internal Floating Roof		Manufacturer	TBD		Model Number	TBD		% Efficiency	99%											
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8. STACK OR EXHAUST DATA  Stack ID: <u>N/A</u> Height: _____ ft Exit diameter: _____ ft Exit gas volume: _____ acfm Exit gas temperature: _____ F  (Include a separate page for each stack if multiple stacks or vents are used)		11. CRITERIA POLLUTANT ESTIMATED EMISSIONS <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">particulates</td> <td style="width: 10%; text-align: center;">0.18</td> <td style="width: 10%; text-align: center;">lb/hr</td> <td style="width: 10%; text-align: center;">0.79</td> <td style="width: 10%; text-align: center;">tons/yr</td> </tr> <tr> <td>sulfur dioxide</td> <td></td> <td style="text-align: center;">lb/hr</td> <td></td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>carbon monoxide</td> <td></td> <td style="text-align: center;">lb/hr</td> <td></td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>nitrogen oxides</td> <td></td> <td style="text-align: center;">lb/hr</td> <td></td> <td style="text-align: center;">tons/yr</td> </tr> <tr> <td>volatile organic compounds</td> <td></td> <td style="text-align: center;">lb/hr</td> <td></td> <td style="text-align: center;">tons/yr</td> </tr> </table> (Include calculations and assumptions)		particulates	0.18	lb/hr	0.79	tons/yr	sulfur dioxide		lb/hr		tons/yr	carbon monoxide		lb/hr		tons/yr	nitrogen oxides		lb/hr		tons/yr	volatile organic compounds		lb/hr		tons/yr
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\*If units other than tons, please specify.

## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <b>TK03</b>		2. PROCESS OR OPERATION NAME <b>Storage Tanks</b>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <b>116,800 gallons</b>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <b>3,500 gal/hr                      60,000,000 gal/yr</b>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <b>3,500 gal/hr                      60,000,000 gal/yr</b>																									
6. PROCESS EQUIPMENT  Type <u>200 Proof Storage Tank</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Ethanol</u>		10. POLLUTION CONTROL EQUIPMENT <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;">Internal Floating Roof</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>Model Number</td> <td style="text-align: center;">TBD</td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;">99%</td> <td></td> </tr> </table>			Primary	Secondary	Type	Internal Floating Roof		Manufacturer	TBD		Model Number	TBD		% Efficiency	99%											
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

## SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT (complete a separate page for each distinct process or manufacturing operation)

1. APPLICANT'S REFERENCE NUMBER <u>TK04</u>		2. PROCESS OR OPERATION NAME <u>Storage Tanks</u>																										
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <u>116,800 gallons</u>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <u>3,500 gal/hr</u> <u>60,000,000 gal/yr</u>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <u>3,500 gal/hr</u> <u>60,000,000 gal/yr</u>																									
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## STATE OF IDAHO

## APPLICATION TO CONSTRUCT AN AIR POLLUTION EMITTING FACILITY

SECTION 3: PROCESS AND MANUFACTURING EQUIPMENT *(complete a separate page for each distinct process or manufacturing operation)*

1. APPLICANT'S REFERENCE NUMBER <b>TK05</b>		2. PROCESS OR OPERATION NAME <b>Storage Tanks</b>																																																								
3. MAXIMUM RATED INPUT CAPACITY (tons/hour)* <b>350,000 gallons</b>	4. NORMAL MAXIMUM FEED INPUT tons/hour                      tons/year <b>7,200 gal/hr                      63,000,000 gal/yr</b>		5. NORMAL MAXIMUM PRODUCT OUTPUT tons/hour                      tons/year <b>7,200 gal/hr                      63,000,000 gal/yr</b>																																																							
6. PROCESS EQUIPMENT  <div style="text-align: center;">Denatured Ethanol</div> Type <u>Storage Tank</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Gasoline</u>		10. POLLUTION CONTROL EQUIPMENT  <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;">Internal Floating Roof</td> <td></td> </tr> <tr> <td>Manufacturer</td> <td></td> <td></td> </tr> <tr> <td>Model Number</td> <td></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;">99%</td> <td></td> </tr> </table>			Primary	Secondary	Type	Internal Floating Roof		Manufacturer			Model Number			% Efficiency	99%																																									
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STATE OF IDAHO

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1. APPLICANT'S REFERENCE NUMBER <b>TK06</b>		2. PROCESS OR OPERATION NAME <b>Storage Tanks</b>																																																			
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6. PROCESS EQUIPMENT  <div style="text-align: right; margin-right: 20px;">Denatured Ethanol</div> Type <u>Storage Tank</u> Manufacturer <u>TBD</u> Model Number <u>TBD</u> Feed Material <u>Gasoline</u>		10. POLLUTION CONTROL EQUIPMENT  <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 40%;"></th> <th style="width: 30%; text-align: center;">Primary</th> <th style="width: 30%; text-align: center;">Secondary</th> </tr> <tr> <td>Type</td> <td style="text-align: center;"><u>Internal Floating Roof</u></td> <td></td> </tr> <tr> <td>Manufacturer</td> <td></td> <td></td> </tr> <tr> <td>Model Number</td> <td></td> <td></td> </tr> <tr> <td>% Efficiency</td> <td style="text-align: center;"><u>99%</u></td> <td></td> </tr> </table> MANUFACTURER GUARANTEED <u>    </u> Yes <u>    </u> no <i>(Include guarantee)</i> For wet scrubbers: water flow <u>                    </u> gpm pressure drop <u>                    </u> inches of water  For baghouses: air/cloth ratio <u>                    </u> pressure drop <u>                    </u> inches of water			Primary	Secondary	Type	<u>Internal Floating Roof</u>		Manufacturer			Model Number			% Efficiency	<u>99%</u>																																				
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\*If units other than tons, please specify.

# **DISPERSION MODELING ANALYSIS**

## **Pacific Ethanol Burley, LLC Burley, Idaho**

*Prepared for:*  
Pacific Ethanol, Inc.  
516 Southeast Morrison St.  
Suite 280  
Portland, OR 97214

*Prepared by:*  
Natural Resource Group, Inc.  
Tower One, Suite 580  
1515 Arapahoe Street  
Denver, CO 80202



**November 2006**

*Project No. PAC2006-105*

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## **LIST OF APPENDICES**

<b>Appendix</b>	<b>Description</b>
APPENDIX A	MODEL INPUTS AND RESULTS
APPENDIX B	FACILITY PLOT PLAN
APPENDIX C	MODELING FILES (CD-ROM)

## EXECUTIVE SUMMARY

Natural Resource Group, Inc. (NRG) has performed an air dispersion modeling analysis for the Pacific Ethanol Burley, LLC (Burley) facility located in Burley, Idaho, using the United States Environmental Protection Agency's (USEPA's) Industrial Source Complex Short-Term Version 3 (ISCST3) with Plume Rise Model Enhancements (PRIME) model. ISCST3 is a steady-state Gaussian plume model recommended by the USEPA for assessing pollutant impacts from facilities with emission points influenced by building downwash, such as the Burley ethanol plant. This dispersion modeling analysis is required as part of the Application for the Authority to Construct submitted November 2006 to the Idaho Department of Environmental Quality (IDEQ).

In accordance with Idaho Department of Environmental Quality (IDEQ)'s State of Idaho Air Quality Modeling Guideline (the Guideline) dated December 31, 2002, the ambient air impacts resulting from the proposed construction of Burley's ethanol plant have been assessed for particulate matter less than 10 microns in diameter (PM<sub>10</sub>), nitrogen oxides (NO<sub>x</sub>), acetaldehyde, arsenic, benzene, cadmium, formaldehyde, nickel, and total PAHs. The results of the dispersion modeling analysis performed are summarized in the following table.

**TABLE ES-1. SUMMARY OF DISPERSION MODELING ANALYSIS RESULTS**

Pollutant	Averaging Period	Location	Modeled Ambient Concentration (µg/m <sup>3</sup> )	Background Concentration (µg/m <sup>3</sup> )	Total Concentration (µg/m <sup>3</sup> )	IDAPA AAC (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )
PM <sub>10</sub>	24-Hour	25 m from SW Fenceline	10.13	76	109.7	---	150
	Annual	NE Fenceline	2.06	27	32.8	---	50
NO <sub>x</sub>	Annual	NE Fenceline	4.42	17	21.5	---	100
Acetaldehyde	Annual	25 m from NE Fenceline	0.33625	---	---	0.45	---
Arsenic	Annual	NE Fenceline	0.00002	---	---	0.00023	---
Benzene	Annual	N Fenceline	0.0526	---	---	0.12	---
Cadmium	Annual	NE Fenceline	0.0001	---	---	0.00056	---
Formaldehyde	Annual	SE Fenceline	0.0318	---	---	0.077	---
Nickel	Annual	NE Fenceline	0.00018	---	---	0.0042	---
Total PAHs	Annual	NE Fenceline	0.00003	---	---	0.00034	---

The results of this dispersion modeling analysis shown above indicate that the construction of the Burley facility will not cause or significantly contribute to a violation of the PM<sub>10</sub> or NO<sub>2</sub> National Ambient Air Quality Standards (NAAQS) or Idaho Administrative Procedures Act (IDAPA)'s Acceptable Ambient Concentrations (AACs) of Toxic Air Pollutants (TAPs).

## **1.0 INTRODUCTION**

Natural Resource Group, Inc. (NRG) has performed an air dispersion modeling analysis for the Pacific Ethanol Burley, LLC (Burley) facility located in Burley, Idaho, using the United States Environmental Protection Agency's (USEPA's) Industrial Source Complex Short-Term Version 3 (ISCST3) with Plume Rise Model Enhancements (PRIME) model. ISCST3 is a steady-state Gaussian plume model recommended by the USEPA for assessing pollutant impacts from facilities with emission points influenced by building downwash, such as the Burley ethanol plant. This dispersion modeling analysis is required as part of the Application for the Authority to Construct submitted November 2006 to the Idaho Department of Environmental Quality (IDEQ).

Burley is proposing to construct a new fuel-grade ethanol production plant with a proposed maximum permitted capacity of 60 million-gallon per year (MMgal/yr) undenatured ethanol plant, or 63 MMgal/yr of denatured ethanol in Burley, Idaho. Emission generating activities at the facility include grain handling and processing, fermentation, distillation, fuel combustion, liquid storage tanks, and equipment and operation fugitives. The primary pollutants emitted from the Burley plant will be PM/PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>2</sub>, VOC, and CO. In addition, the Burley plant will emit toxic air pollutant (TAPs).

## **2.0 FACILITY EMISSIONS SOURCES**

### **2.1 Potential Emissions**

Air pollutant emissions from the facility are generated by material handling, fuel combustion, and ethanol production process operations. The primary pollutants emitted will be PM/PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>2</sub>, VOC, and CO. In addition, the Burley plant will emit toxic air pollutant (TAPs). A summary of the potential emissions from the proposed facility constructions and supporting emission calculations are included in the November 2006 Application for the Authority to Construct. Table A-1 of Appendix A presents the emission rate of pollutants modeled in this analysis.

### **2.2 Source Types and Parameters**

There are several types of emission sources that can be modeled in ISCST3. These source types include point sources, area sources, and volume sources. The majority of sources modeled are point sources, which consist of emission units that release all (or most) of their emissions out a stack or vent. Some sources, however, are much more complex and difficult to model using mathematical simulations. Fugitive sources such as the emissions from material handling operations do not typically have a single point of emission and are typically categorized as "pseudo" point, area, or volume sources. The Burley facility sources include conventional point and fugitive sources.

Each source of emissions has several parameters that are required for the dispersion modeling analysis. The parameters for the sources included in this analysis are presented in Tables A-2 and A-3 of Appendix A, respectively. Table A-4 presents a summary of the results. The facility plot plan is included in Appendix B.

### 3.0 MODELING METHODOLOGY

USEPA's ISCST3 PRIME model was used to estimate the potential air quality impacts of the proposed ethanol facility. ISCST3 is a steady-state Gaussian plume model recommended by the USEPA for assessing pollutant impacts from facilities with emission points influenced by building downwash, such as the Burley facility. When conducting a comprehensive NAAQS compliance demonstration, existing background air quality data is combined with modeled impacts and compared against the applicable standard.

#### 3.1 Modeling Applicability

Burley has conducted dispersion modeling to evaluate the potential impacts from the proposed facility's PM<sub>10</sub> and NO<sub>x</sub> emissions for comparison to the applicable short-term and annual significant contribution levels and NAAQS. For TAPs, dispersion modeling was performed to determine the potential impacts from the proposed facility's acetaldehyde, arsenic, benzene, cadmium, formaldehyde, nickel, and total PAHs emitted above Idaho Administrative Procedures Act (IDAPA) 58.01.01.585 and 586 screening emission levels (ELs) for comparison against their Acceptable Ambient Concentrations (AACs).

#### 3.2 Significance Modeling

To determine whether emissions of a pollutant are required to be modeled for comparison with the ambient air standards (full impact analysis), it must be determined if the emissions have a significant impact on ambient air quality. Receptor grids used for determining significance are the same as those used in the refined modeling analysis (see Section 3.6). If the maximum modeled off-site concentration is greater than the significant contribution level (SCL), the source impact is considered significant and a full impact analysis (FIA) must be performed. The SCLs are listed below in Table 3.1.

TABLE 3-1. SIGNIFICANT CONTRIBUTION LEVELS

Pollutant	Significant Contribution Level (µg/m <sup>3</sup> )	
	24-Hour	Annual
PM <sub>10</sub>	5	1
NO <sub>x</sub>	---	1

For TAPs, the maximum modeled off-site concentration for the TAP is compared to its AAC for compliance determination. Table 3.2 lists the AACs for the modeled TAPs.

**TABLE 3-2. ACCEPTABLE AMBIENT CONCENTRATIONS**  
**Pacific Ethanol Burley, LLC – Burley, Idaho**

Toxic Air Pollutant	Acceptable Ambient Concentrations ( $\mu\text{g}/\text{m}^3$ )
Acetaldehyde	0.45
Arsenic	0.00023
Benzene	0.12
Cadmium	0.00056
Formaldehyde	0.077
Nickel	0.0042
Total PAHs	0.00034

### 3.3 Full Impact Analysis (FIA)

Pollutant emissions from a proposed facility or modification, which could have a significant impact on air quality, must be demonstrated to not cause or significantly contribute to a violation of the ambient air quality standards. For major PSD sources, the FIA must demonstrate compliance with the NAAQS and PSD increments. For non-PSD major sources, the FIA must demonstrate compliance with the NAAQS.

The NAAQS were established by the USEPA under the authority of the Clean Air Act. Primary NAAQS define levels of air quality that the USEPA deems necessary to protect public health. Secondary NAAQS define levels of air quality that the EPA judges necessary to protect public welfare from any known, or anticipated adverse effects of a pollutant. Examples of the public welfare that are protected by the secondary NAAQS include wildlife, buildings, national monuments, vegetation, visibility, and property values. The USEPA has NAAQS for the following criteria pollutants:  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$ ,  $\text{NO}_2$ ,  $\text{SO}_2$ , CO, ozone, and lead. Table 3.3 lists the NAAQS as well as the compliance demonstration method for the pollutants included in this analysis.

**TABLE 3-3. NATIONAL AMBIENT AIR QUALITY STANDARDS  
AND COMPLIANCE METHOD**

Pollutant	Averaging Period	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Compliance Method
PM <sub>10</sub>	24-Hour	150	Highest, 2 <sup>nd</sup> Highest Ambient Concentration
	Annual	50	Highest Ambient Concentration
NO <sub>2</sub>	Annual	100	Highest Ambient Concentration

### 3.4 Modeling Options

All regulatory default options, except missing meteorological data, are selected for the analysis. These options include:

- No gradual plume rise (except for building downwash)
- Stack tip downwash (except for cases outlined in the Guideline)
- Buoyancy induced dispersion (except for Schulman-Scire downwash)
- Calm wind data processing
- Upper bound concentration estimates for sources influenced by building downwash from super-squat buildings
- Default wind speed profile exponents
- Default vertical potential temperature gradients

Based on land use classifications from United States Geological Survey (USGS) topographical maps, the majority (*i.e.*, > 50%) of the land surrounding the proposed facility can be classified as suburban or rural. Therefore, the rural dispersion coefficients are used.<sup>1</sup> Elevated terrain is used in the modeling analysis to accurately account for the mild geographical terrain features surrounding the proposed site. The terrain elevations are established using digital elevation model (DEM) files from the USGS. The files used for this modeling analysis are listed below in Table 3.4.

<sup>1</sup> Per 40 CFR 51 Appendix W "Guideline on Air Quality Models" Section 8.2.8, the urban/rural classification is determined based on the land use classification of the area that is circumscribed by a 3 kilometer radius about the source. If at least 50 percent of the land is commercial, heavy industrial, light-medium industry, close packed single family dwellings with no driveways, or older style, multi-family dwellings the urban dispersion coefficients may be used. Otherwise the default rural dispersion coefficients shall be used.



**TABLE 3-4. USGS DIGITAL ELEVATION MODEL (DEM) FILES**

USGS QUADRANGLE TITLE	DEM FILE NAME
Kenyon, Idaho	42113D7.DEM
Burley, Idaho	42113E7.DEM
Burley Southwest, Idaho	42113E8.DEM

### **3.5 Ambient Air Boundary**

The NAAQS and ambient air increments apply to air that is considered ambient. In accordance with the Guideline, ambient air is that portion of the atmosphere, external to buildings, to which the general public has access. In most cases, ambient air boundaries are delineated based on the location of a fence or other significant physical barrier that restricts public access. The proposed site will be fenced. As a result, the ambient air boundary for the facility was assumed to follow the fence line.

### **3.6 Receptor Grid**

ISCST3 model concentrations are estimated at discrete receptor locations. The discrete Cartesian receptor grid is designed to identify maximum predicted impacts due to the proposed facility. The following receptor systems were used in this analysis:

- A fenceline receptor grid with receptors placed along the fenceline at an interval distance of 25 meters;
- A tight Cartesian grid extending 200 meters from the site in every direction with receptors located at an interval distance of 25 meters;
- A fine Cartesian grid extending 500 meters from the site in every direction with receptors located at an interval distance of 50 meters;
- A medium Cartesian grid extending 2 kilometers from the site in every direction with receptors located at an interval distance of 100 meters; and
- A coarse Cartesian grid extending 5 kilometers from the site in every direction with receptors located at an interval distance of 250 meters.

### **3.7 Meteorological Data**

The dispersion modeling analysis was performed using ISC-ready meteorological data provided by the IDEQ for Heyburn, Idaho, which is approximately 10 kilometers from the proposed site. These data included one year of hourly onsite surface data acquired by the Simplot Company and had been approved by the IDEQ. It should be noted, per discussion with IDEQ, that since these data have some missing information, the non-regulatory option for missing data was used (see Section 3.4).

### 3.8 Building Downwash

Emissions modeled from the Burley facility were evaluated to determine if the emissions plume may become entrained in turbulent wakes, thus resulting in potentially higher ambient air impacts. These wake effects, also known as downwash, are the result of air flowing around large buildings and structures creating areas, or "zones", of turbulent airflow.

The minimum stack height necessary to avoid downwash effects, known as Good Engineering Practice (GEP) stack height, is defined by the following equation.

$$H_{GEP} = H + 1.5L \quad (\text{Equation 1})$$

Where,

$H_{GEP}$	=	GEP stack height
$H$	=	structure or building height
$L$	=	the lesser of the structure height or projected width

This equation applies only to stacks located within 5L of a downwash structure. Stacks located more than 5L from the downwash structure are not subject to the wake effects of that structure. If more than one stack at the facility is modeled, the equation must be successively applied to each stack. If more than one structure is modeled, the equation must also be successively applied to each structure. The building downwash determination for this modeling analysis is performed for each stack and structure using the USEPA-approved Building Profile Input Program (BPIPPRM) that is compatible with ISC-PRIME. BPIPPRM will perform the aforementioned calculation for every 10-degree directional interval starting at 10 degrees and going clockwise to 360 (due North).

## **4.0 DISPERSION MODELING RESULTS**

### **4.1 Significance Modeling Results**

The proposed PM<sub>10</sub> and NO<sub>x</sub> emissions were modeled and compared to the SCLs. The dispersion modeling indicated that PM<sub>10</sub> and NO<sub>x</sub> impacts are above the SCLs. Since the impacts from the Burley facility were predicted to be greater than the SCLs for PM<sub>10</sub> and NO<sub>x</sub>, a full impacts analysis was performed, which requires the addition of nearby sources identified by the IDEQ as significant sources of air contaminants.

The proposed acetaldehyde, arsenic, benzene, cadmium, formaldehyde, nickel, and total PAHs emissions were modeled and compared to their AACs since these TAPs emissions are above their ELs. The dispersion modeling indicated that the TAPs impacts are below the AACs, as shown in Table A-4 of Appendix A. Therefore, the proposed construction of the Burley facility complies with the IDAPA's TAPs AACs.

### **4.2 GEP Stack Height Determinations**

As specified by the USEPA in Appendix W of 40 CFR 51 Section 7.2.5, no stack height credit may be given in excess of the GEP stack height for any source when determining emission limitations for compliance with the NAAQS and PSD increments. As defined in 40 CFR 51.100, GEP stack height is the greater of 65 meters or the height determined using the equation discussed in Section 3.9. The stack heights used for the dispersion modeling analysis are well below 65 meters. Therefore, the emission rates and stack heights used in the modeling analysis are appropriate for demonstrating compliance with the NAAQS. Building downwash has been calculated and included in the dispersion modeling for all stacks as mentioned in Section 3.9.

### **4.3 Nearby Sources**

Facilities that must demonstrate compliance with the NAAQS must also include any sources within 1,000 meters of the proposed site as indicated by IDEQ staff<sup>2</sup>. However, based on correspondence with IDEQ staff<sup>3</sup>, no significant sources of PM<sub>10</sub> and NO<sub>x</sub> located near the Burley facility were identified; thus, there were no nearby sources included in the full impacts analysis.

### **4.4 Background Concentrations**

The existing ambient air concentrations must be accounted for when demonstrating compliance with the NAAQS. The existing ambient air concentrations (often referred to as background concentrations) are often estimated using ambient air monitoring data from the air basin that the proposed site is located. This method of estimating the background concentration is conservative because it accounts for the existing air pollutant concentrations including existing stationary source impacts. Therefore, FIA that use the ambient air monitoring data as background concentrations and include

<sup>2</sup> Per a October 20, 2006 email from Kevin Schilling, at IDEQ, to Warner Reeser, at Natural Resource Group, "Re: Burley Protocol."

<sup>3</sup> Per a October 23, 2006 email from Kevin Schilling, at IDEQ, to Warner Reeser, at Natural Resource Group, "Re: Burley Protocol."

nearby sources are double counting the configuration of actual emissions from existing facilities. For this modeling analysis, the background concentration is estimated based on information supplied to NRG by the IDEQ. The background concentrations used in this modeling analysis are shown in Table 4.1.

**TABLE 4-1. BACKGROUND CONCENTRATIONS FOR BURLEY, IDAHO**

Pollutant	Averaging Period	Concentration ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	24-Hour	76
	Annual	27
NO <sub>x</sub>	Annual	17

#### **4.5 NAAQS Analysis**

As documented in the modeling results summary table (Table A-4 of Appendix A), the total impacts of PM<sub>10</sub> and NO<sub>x</sub>, which includes the modeled impacts from the proposed Burley facility and existing background concentrations of the pollutants in the Burley, Idaho area, are below the applicable NAAQS for each averaging period. Therefore, the proposed project complies with the PM<sub>10</sub> and NO<sub>2</sub> NAAQS.

## **5.0 MODELING RUNS AND OUTPUT**

The ISCST3 input, output, meteorological data, and BPIP files for the modeling analysis are included on the CD-ROM found in Appendix C.

## **Appendix A – Model Inputs and Results**



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TABLE A-1

Facility Emissions Summary Table for Modeled Pollutants<sup>1</sup>  
Pacific Ethanol Burley, LLC - Burley, Idaho

Stack ID	Facility Emission Sources	Pollutant Emission Rates								
		PM <sub>10</sub> (g/s)	NO <sub>x</sub> (g/s)	Acetaldehyde (g/s)	Arsenic (g/s)	Benzene (g/s)	Cadmium (g/s)	Nickel (g/s)	Formaldehyde (g/s)	Total PAHs (g/s)
SV01	Corn Receiving Baghouse	1.08E-01								
SV02	Corn Handling Baghouse	5.41E-02								
SV03	Corn Bin #1	4.32E-03								
SV04	Corn Bin #2	4.32E-03								
SV05	Surge Bin Spot Filters	2.30E-03								
SV06	Hammermilling Baghouse	4.86E-02								
SV12	RTO	5.70E-03	3.77E-02	1.59E-01	1.48E-07	3.00E-03	8.14E-07	1.56E-06	1.65E-04	
SV09	Boiler #1	7.11E-02	4.76E-01		1.87E-06	1.96E-05	1.03E-05	1.96E-05	6.99E-04	3.70E-06
SV10	Boiler #2	7.11E-02	4.76E-01		1.87E-06	1.96E-05	1.03E-05	1.96E-05	6.99E-04	
SV11	Boiler #3	7.11E-02	4.76E-01		1.87E-06	1.96E-05	1.03E-05	1.96E-05	6.99E-04	
Total		0.44	1.47	1.59E-01	5.75E-06	3.06E-03	3.16E-05	6.04E-05	2.26E-03	3.70E-06

**NOTES:**

1. Emissions included in this table are based on information represented in the October 2006 Application for Authority to Construct.

**Table A-2**  
**Modeled Stack Parameters Summary Table - Point Sources**  
**Pacific Ethanol Burley, LLC - Burley, Idaho**

Stack ID	Facility Emission Sources	Source Location			Source Parameters			
		UTM E (m)	UTM N (m)	Elevation (m)	Stack Ht (m)	Temp (°K)	Exit Velocity (m/s)	Diameter (m)
SV01	Corn Receiving Baghouse	268655.00	4711403.00	1287.48	19.8	0	61.185	0.4481
SV02	Corn Handling Baghouse	268658.28	4711420.50	1287.48	19.8	0	30.597	0.4481
SV03	Corn Bin #1	268660.25	4711437.00	1287.48	20.4	0	2.109	0.3414
SV04	Corn Bin #2	268655.00	4711403.00	1287.48	20.4	0	2.109	0.3414
SV05	Surge Bin Spot Filters	268675.25	4711446.50	1287.48	9.1	0	0.586	0.4572
SV06	Hammermilling Baghouse	268660.25	4711459.00	1287.48	18.3	0	6.612	0.9144
SV09	Boiler #1	268801.25	4711560.50	1287.48	13.7	427.59	11.505	0.9144
SV10	Boiler #2	268807.13	4711559.00	1287.48	13.7	427.59	11.505	0.9144
SV11	Boiler #3	268811.69	4711558.00	1287.48	13.7	427.59	11.505	0.9144
SV12	RTO	268673.94	4711529.00	1287.48	13.7	355.37	4.657	1.5200

**NOTES:**

1. The stack parameters were provided by Delta T and are included in the November 2006 Application for Authority to Construct.



**Table A-3**  
**Building and Tank Parameters Summary Table**  
**Pacific Ethanol Burley, LLC - Burley, Idaho**

**Buildings**

Building	No. of Tiers	Base Elevation (ft)	Tier Height (m)	No. of Corners	Corner	UTM E (m)	UTM N (m)
Boiler	1	4224	12.19	4	1	268786.5	4711577.5
					2	268815.0	4711577.5
					3	268815.0	4711555.0
					4	268786.5	4711555.0
MCC	1	4224	6.10	4	1	268815.0	4711577.0
					2	268827.5	4711577.0
					3	268827.5	4711555.0
					4	268815.5	4711555.0
Administrative	1	4224	6.10	4	1	268793.9	4711439.5
					2	268793.9	4711470.0
					3	268822.9	4711469.0
					4	268822.9	4711439.5
Process	1	4224	18.29	4	1	268745.1	4711444.0
					2	268747.4	4711537.5
					3	268778.1	4711536.5
					4	268774.9	4711444.0
Fermentation	1	4224	7.01	4	1	268716.5	4711434.0
					2	268719.8	4711538.0
					3	268747.7	4711537.0
					4	268745.1	4711433.0
Cooling Tower	1	4224	10.36	4	1	268748.3	4711609.5
					2	268748.3	4711603.5
					3	268759.6	4711603.5
					4	268759.0	4711610.0
DD&E	1	4224	12.19	4	1	268736.4	4711580.5
					2	268735.7	4711557.5
					3	268760.9	4711557.0
					4	268759.6	4711580.5

**Tanks and Silos**

Tank/Silo	Base Elevation (ft)	UTM E Center (m)	UTM N Center (m)	Tank Height (m)	Tank Diameter (m)
Grain #1	4224	268658.6	4711437.5	25.3	18.3
Grain #2	4224	268655.0	4711403.5	25.3	18.3
Tank 01	4224	268705.2	4711566.5	8.5	4.6
Tank 02	4224	268693.5	4711567.5	10.4	6.1
Tank 03	4224	268675.0	4711567.5	10.4	7.6
Tank 04	4224	268694.2	4711582.5	10.4	7.6
Tank 05	4224	268696.3	4711603.0	12.2	12.2
Tank 06	4224	268675.0	4711603.5	12.2	12.2

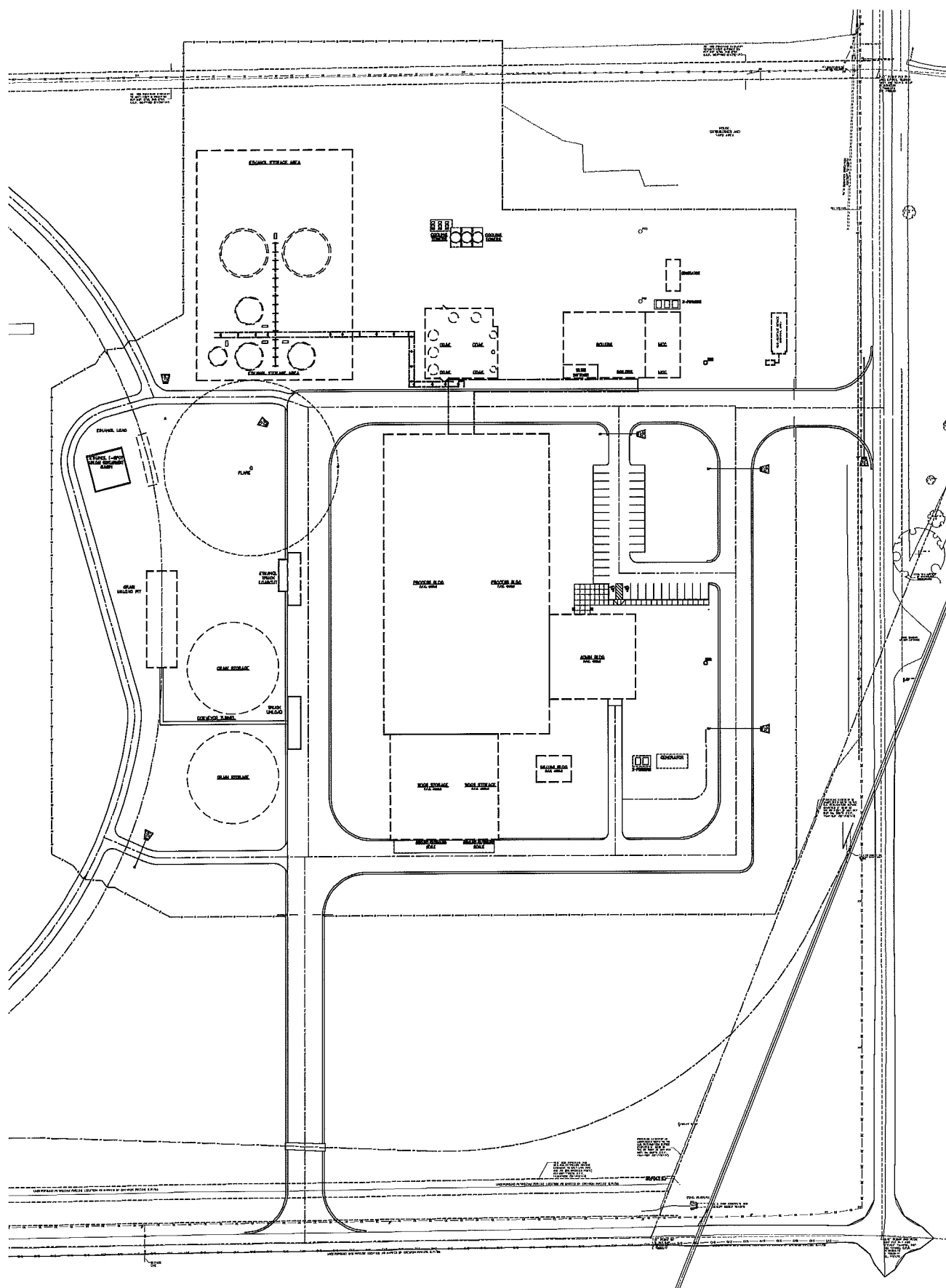
Table A-4  
Modeled Results Summary Table  
Pacific Ethanol Burley, LLC - Burley, Idaho

Pollutant	Averaging Period	Location	Impacts Summary			
			Modeled ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	Total ( $\mu\text{g}/\text{m}^3$ )	IDAPA's AAC ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	24-Hour	SW Fenceline	33.70	76	109.70	150
	Annual	SW Fenceline	5.80	27	32.80	50
NO <sub>x</sub>	Annual	25 m from NE Fenceline	4.50	17	21.50	100
	Annual	25 m from NE Fenceline	0.33625			
Acetaldehyde	Annual	NE Fenceline	0.00002			0.45
Arsenic	Annual	N Fenceline	0.061			0.00023
Benzene	Annual	NE Fenceline	0.0001			0.12
Cadmium	Annual	S Fenceline	0.032			0.00056
Formaldehyde	Annual	NE Fenceline	0.00019			0.077
Nickel	Annual	NE Fenceline	0.00003			0.0042
Total PAHs	Annual	NE Fenceline				0.00034

## **Appendix B – Facility Plot Plan**



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## **Appendix C – Modeling Files (CD-ROM)**



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